The PHOTOFACT Servicer

SET 462 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ NOV., 1959

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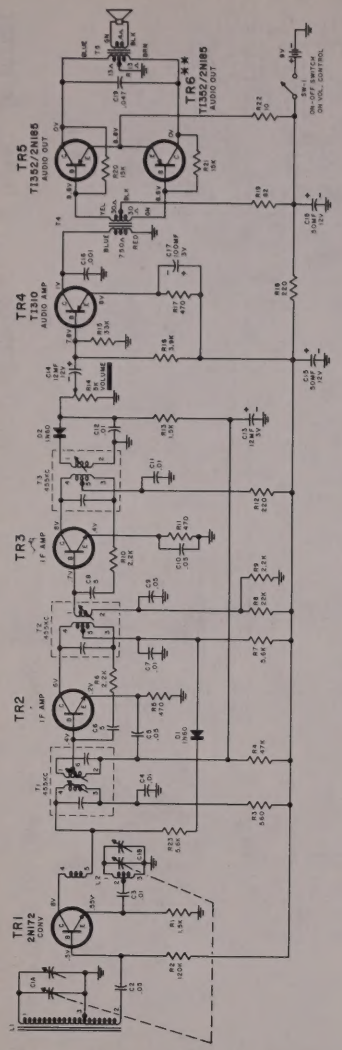
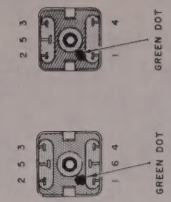
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

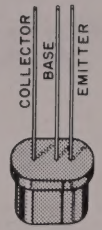
CBS Models
TR260, TR261,
TR262

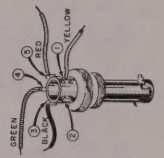
Dukane Models
14A290B, B1, C,
14A390



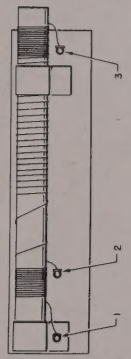


T1—I.F. Trans. T2 T3—I.F. Trans.





L2—Oscillator Coil



L1—Antenna Coil

RESISTANCE READINGS

Terminal	TR 1	TR 2	TR 3	TR 4	TR 5	TR 6
Base	120K	7K	6K	4K	110	110
Emitter	*1.5K	*500	*500	700	10	10
Collector	780	4K	450	*750	*13	*13

Resistances in ohms. K=X1, 000. Transistors removed from sockets.
*Measured from transistor socket terminals to chassis. All other readings to C1B & R19.

NOTES

1. Voltages taken with VTVM from transistor socket terminals to chassis. Tuning capacitor set to minimum.
2. Capacitor values of less than one are microfarads and values greater than one are micro-microfarads, unless otherwise indicated.
3. Resistors are all ½W, 10%. K=X1, 000.
4. Resistance reading taken with transistors removed from socket, and components disconnected from circuit.
5. Battery current
   Zero signal — 5 ma.
   Maximum signal — 40 ma.

Alignment

Set volume control at maximum. Use just enough signal generator output to provide satisfactory indication.

Connect the output of the generator to a coil consisting of five turns of wire, five inches in diameter, and radiate signal to receiver loop. Bring the coil just close enough to the receiver's loop to obtain satisfactory indication on output meter.

Step 1 (IF alignment) must be performed with chassis removed from cabinet to gain access to IF slugs. Steps 2, 3 and 4 (RF alignment) are performed with chassis in cabinet. The chassis must be in normal operating position with respect to the brass dial escutcheon to retain correct tracking.

Step	Signal Generator		Receiver Tuning	Output Meter Connection	Adjust
	Freq.	Connect To			
1	455 KC MOD.	See preliminary instructions above.	Minimum Capacity	Across voice coil	T3, T2 & T1 for maximum indication
2	1620 KC MOD.	As Above	As Above	As Above	C1B, Oscillator trimmer, for maximum indication
3	1400 KC MOD.	As Above	For maximum indication	As Above	C1A, Antenna trimmer for maximum indication
4	540 KC MOD.	As Above	Maximum Capacity	As Above	L2 for maximum indication (See note below)

Note: Repeat steps 2 and 3 after completing step 4.

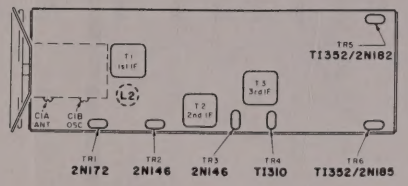


Figure 1 Transistor and trimmer locations

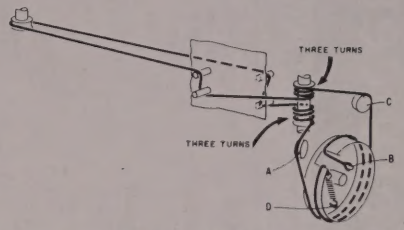
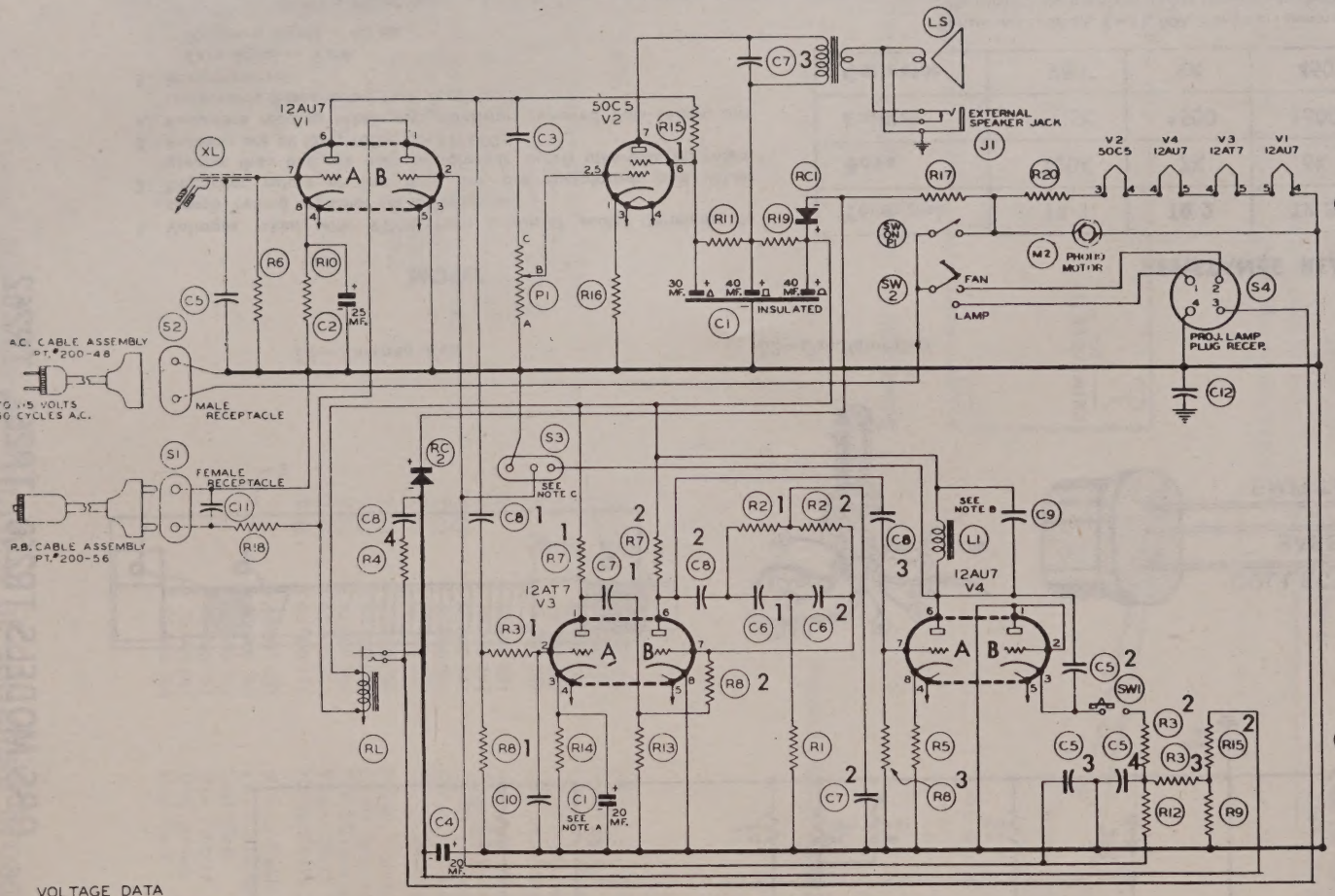


Figure 2 Dial Stringing

Cabinet

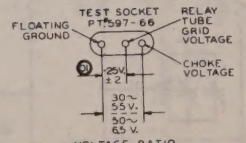
70 002 811	Cabinet, Masonite, Ebony (TR260)
70 002 812	Cabinet, Wood, Blonde (TR261)
70 002 813	Cabinet, Wood, Fruitwood (TR262)
76 004 146	Knob, On-Off-Volume, Ebony (TR260)
76 004 144	Knob, On-Off-Volume, Blonde (TR261)
76 004 148	Knob, On-Off-Volume, Brown (TR262)
76 004 147	Knob, Tuning, Ebony (TR260)
76 004 145	Knob, Tuning, Blonde (TR261)
76 004 149	Knob, Tuning, Brown (TR262)
73 001 132	Grille Cloth (TR260)
73 001 133	Grille Cloth (TR261)
73 001 134	Grille Cloth (TR262)
73 001 251	Speaker, 6 x 9
46 006 781	Decorative Bezel
48 000 441	Handle
48 000 431	Handle Retainer
47 001 871	Spring (handle detent)
88 000 361	Dial Scale
42 000 061	Battery, Eveready #276

D1, D2	63 000 181	1N60, Crystal Diode
L1	79 000 391	Rod Antenna
L2	15 000 811	Oscillator Coil
T1	12 001 321	I.F. Transformer
T2, T3	12 001 331	I.F. Transformer
T4	10 000 801	Interstage Audio Transformer
T5	10 000 791	Output Transformer
TR1	63 000 141	2N172 Transistor
TR2	63 000 201	2N146 Transistor (Green dot)
TR2	63 000 151	2N146 Transistor (Yellow dot)
TR3	63 000 151	2N146 Transistor (Yellow dot)
TR3	63 000 211	2N146 Transistor (Red dot)
TR4	63 000 161	TI310 Transistor
TR5	63 000 171	TI352/2N185 Transistor
TR6	63 000 171	TI352/2N185 Transistor
	44 001 421	Battery Cable Assembly
	53 000 701	I.F. Trans-Mounting Clip
	46 006 741	Dial Plate
	46 006 761	Dial Pointer
	76 002 661	Dial Spring
	76 004 344	Dial Cord



VOLTAGE DATA

1. ALL VOLTAGES MEASURED BETWEEN TUBE SOCKET TERMINALS AND FLOATING GROUND.
2. LINE VOLTAGE=115 VOLT 60 CYCLE.
3. D.C. VOLTAGES MEASURED WITH RCA VOLT OHMIST V.T. VOLTMETER.
4. A.C. VOLTAGES MEASURED WITH A BALLANTINE MODEL #643.
5. VOLTAGES MAY VARY WITH DIFFERENT TUBES, BUT SHOULD BE GENERALLY 20% ACCURATE.
6. VOLUME CONTROL MAXIMUM.
7. AUTOMATIC MANUAL SWITCH IN AUTOMATIC POSITION.
8. A.C. 30 CYCLE INPUT - AND A.C. 50 CYCLE INPUT VOLTAGES ARE MEASURED WHILE STANDARD RECORDING #606-5 IS BEING PLAYED.



VOLTAGE RATIO 30/50 CYCLE TO BE 6:1 OR BETTER.

TUBE VOLTAGES

TUBE TYPE		SOCKET PIN NUMBER 1	2	3	4	5	6	7	8	9
V1 12AU7	D.C. NO SIGNAL	139	-25				60		3	
	A.C. 30~ INPUT						2			
	A.C. 50~ INPUT						2.6			
V2 50C5	D.C. NO SIGNAL	7					116	118		
	A.C. 30~ INPUT									
	A.C. 50~ INPUT									
V3 12AT7	D.C. NO SIGNAL	73		2			47	-1		
	A.C. 30~ INPUT	24					30			
	A.C. 50~ INPUT	24					11			
V4 12AU7	D.C. NO SIGNAL			4.5			140		8	
	A.C. 30~ INPUT			55			55	30		
	A.C. 50~ INPUT			6.5			6.5	13.5		

NOTES:

A. C1, CAPACITOR, 20 MF. 25 V. IS ONE SECTION OF CAPACITOR PT.#199-2915.

B. L1, REACTOR - AUDIO, TO BE TUNED TO 30 CYCLES.

C. S3, RECEPTACLE - 3 PRONG, IS NOT SUPPLIED WITH A TEST PLUG, - ALDEN PT.#HA903-P.

LIST OF ELECTRICAL PARTS

LEGEND	DESCRIPTION	QNTY	PART NO.
C1	CAPACITOR - ELECTROLYTIC		
	40-40-30 MFD. 150 V.		
	20 25 V.	1	199-2915
C2	CAPACITOR 25 " 25 V.	1	199-2931
C3	" .0033 " 500 V.	1	199-1003-332
C4	" 20 " 150 V.	1	199-2016-206
C5	" .1 " 200 V.	4	199-4011-104
C6	" .01 " 200 V.	2	199-4013-103
C7	" .02 " 200 V.	3	199-4013-203
C8	" .05 " 200 V.	4	199-4018-503
C9	" .5 " 200 V.	1	199-4013-504
C10	" .005 " 400 V.	1	199-4020-502
C11	" .03 " 400 V.	1	199-4021-303
C12	" .05 " 400 V.	1	199-4021-503
V1, V4	ELECTRON TUBE	2	262-12AU7
V2	ELECTRON TUBE	1	262-50C5
V3	ELECTRON TUBE	1	262-12AT7
J1	JACK - FOR EXTERNAL SPKR.	1	415-4
PL1	PLUG - PROJECTOR LAMP	1	570-3052
L1	REACTOR - AUDIO	1	593-12
RC1	RECTIFIER - SELENIUM	1	595-10
RC2	RECTIFIER - SELENIUM	1	595-11
RL	RELAY - S.P.S.T.	1	596-29
S1	RECEPTACLE - PUSH BUTTON	1	597-60
S2	" - A.C. LINE	1	597-61
S3	" - 3 PRONG	1	597-66
R1	RESISTOR 270 K OHM ½ W.	1	600-0073-274
R2	" 510 K " "	2	600-0073-514
R3	" 1.2 MEG. " "	3	600-0080-125
R4	" 150 " " "	1	600-0080-151
R5	" 15 K " "	1	600-0080-153
R6	" 1.5 MEG. " "	1	600-0080-155
R7	" 180 K " "	2	600-0080-184
R8	" 2.7 MEG. " "	3	600-0080-275
R9	" 47 K " "	1	600-0080-473
R10	" 3900 " "	1	600-0080-392
R11	" 4700 " "	1	600-0080-472
R12	" 470 K " "	1	600-0080-474
R13	" 4.7 MEG. " "	1	600-0080-475
R14	" 5600 " "	1	600-0080-562
R15	" 68 K " "	2	600-0080-683
R16	" 150 " 1 W.	1	600-0118-151
R17	" 22 " "	1	600-0118-220
R18	" 6800 " "	1	600-0118-682
R19	" 250 " 5 W.	1	600-1008-251
R20	" 200 " 10 W.	1	600-1013-201
P1	POTENTIOMETER .5 MEG. & SW	1	601-110
S4	SOCKET - FOR PROJECTOR	1	635-03-08628
L2	INDUCTANCE - SOLENOID	1	659-1
SW1	SWITCH - SLIDE S.P.S.T.	1	680-23
SW2	SWITCH - TOGGLE	1	680-246
XL	PICKUP CARTRIDGE - CERAMIC	1	563-53
M1	MOTOR - BLOWER	1	494-41
M2	MOTOR - PHONO	1	494-50
N1	PROJECTOR LAMP 300 WATT	1	456-17
LS	LOUDSPEAKER & TRANSFORMER	1	S-11025

DUKANE MODELS 14A290B, B1, C, 14A390

Schematic Diagram Courtesy of Dukane Corporation

PHOTOFACT* Folder with CIRCUITRACE*

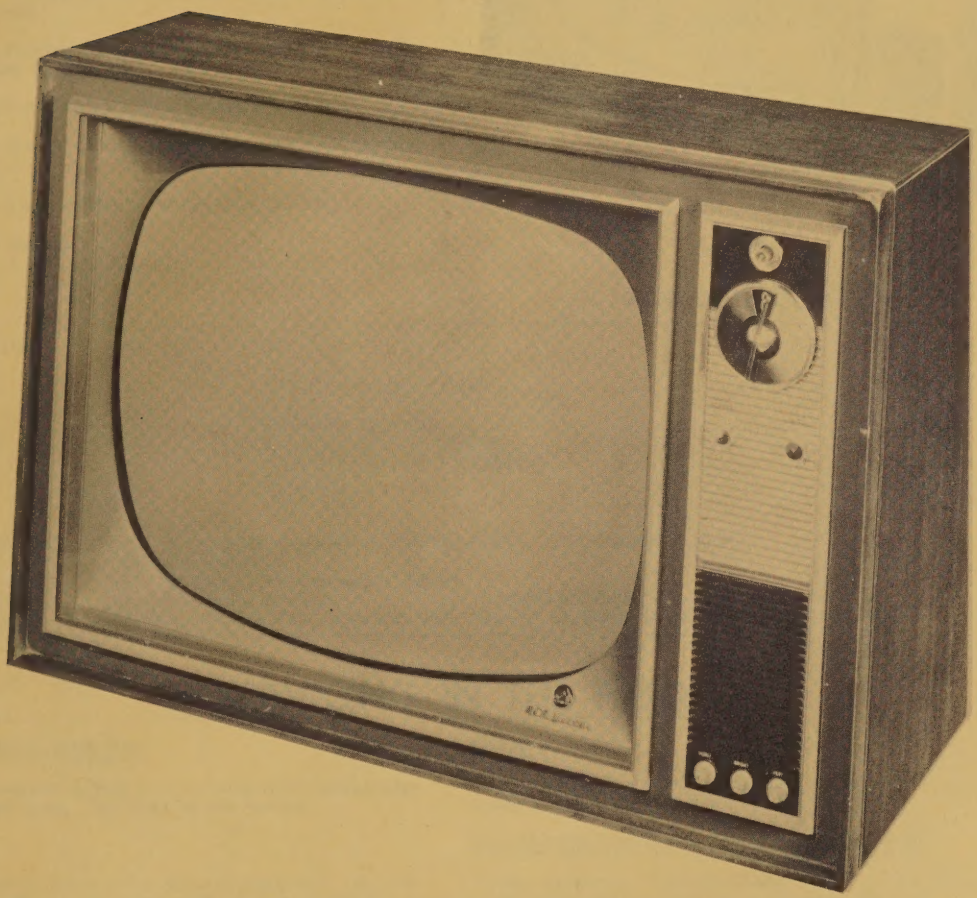
RCA VICTOR CHASSIS
KCS127A, F, L, LX, M, MX

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

RCA VICTOR CHASSIS
KCS127A, F, L, LX, M, MX



MODEL 210T195 (Ch. KCS127A)

RCA VICTOR CHASSIS
KCS127A, F, L, LX, M, MX

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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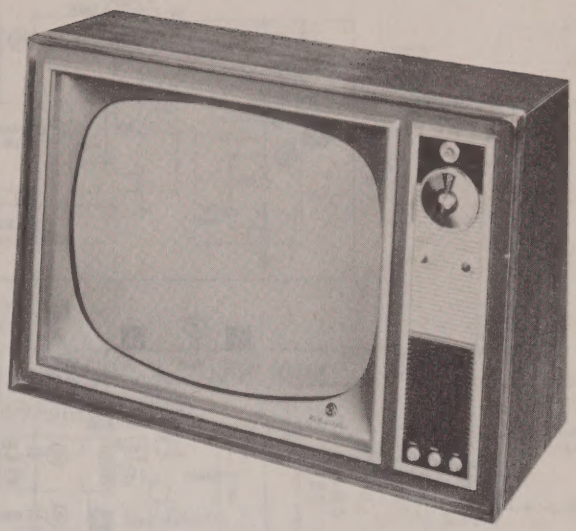
SET 462 FOLDER 1

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 210T195

1. Remove 7 wood screws and 1 metal clip holding the rear cover. Remove antenna leads. Remove rear cover.
2. Remove 7 push-on type knobs from the front.
3. Remove speaker leads, yoke plug, picture tube socket, and HV lead.
4. Remove 2 chassis brace screws, one near Contrast control, other on HV cage.
5. Remove 5 chassis bolts from bottom of cabinet.
6. Remove 2 wood screws holding the lower front control bracket.
7. Remove 4 nuts holding tuner mounting bracket.
8. Remove chassis.



MODEL 210T195 (Ch. KCS127A)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		210T195, 210T196, 210T199	KCS127A
			KCS127B
		210KA465, 210KA466	KCS127F
		240K495, 240K496, 240K497	KCS127L
		240K495X, 240K496X, 240K497X	KCS127LX
		240K495U	KCS127M
		240K495XU	KCS127MX
MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.		
TYPE SET	Television Receiver		
TUBES	VHF-Eighteen, UHF-Nineteen or Twenty		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 200 Watts, 1.9 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

RCA VICTOR CHASSIS
KCS127A, F, L, LX, M, MX

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws holding the trim strip at the bottom edge of the safety glass. Tilt glass out and remove.

FUSE

Two fuse wires are used for filament protection. (For location, see M1 and M2 in photo "Chassis Bottom View".)

FUSE DEVICE

A 12.5Ω fusible resistor (R76) is used for horizontal sweep circuit protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up VHF Oscillator, remove the Channel Selector knob.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Stabilizing coil. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width coil. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive trimmer. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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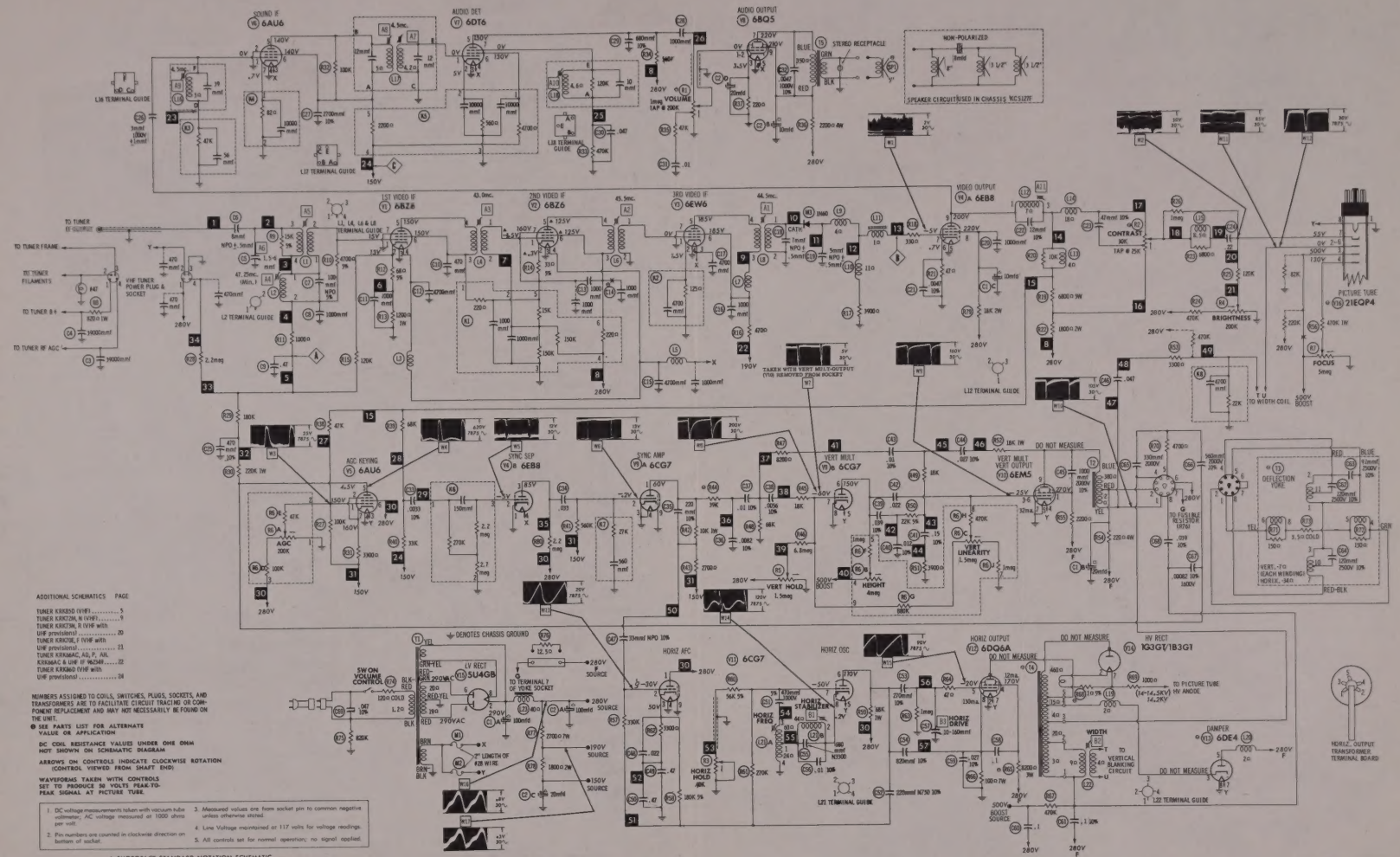
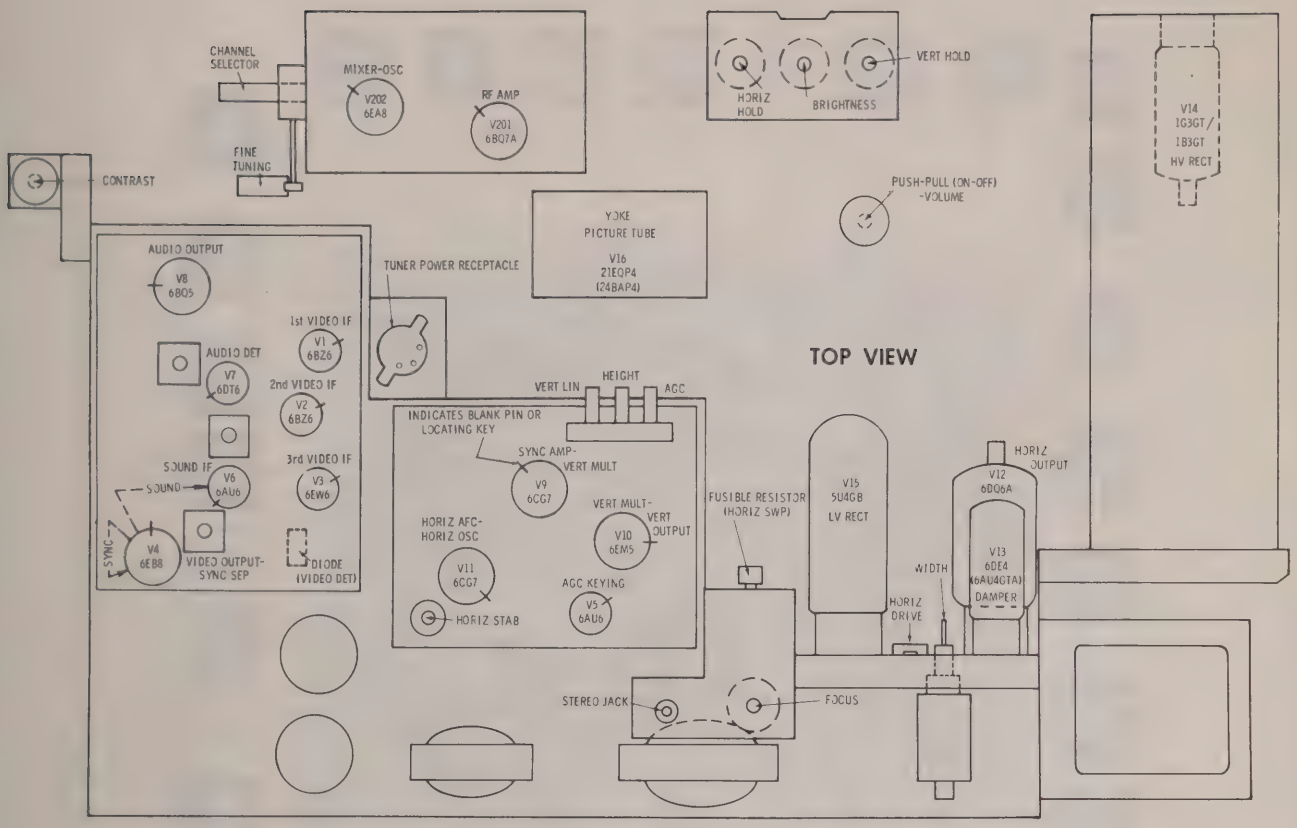
JA578

SET 462 FOLDER 1


SOUND IF V6 6AU6
AUDIO DET V7 6DT6
AUDIO OUTPUT V8 6BQ5
1ST VIDEO IF V1 6BZ8
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6EW6
VIDEO OUTPUT V4A 6EB8
SYNC SEP V4B 6EB8
SYNC AMP V5A 6CG7
AGC KEYING V5 6AU6
VERT MULT V6 6CG7
VERT MULT VERT OUTPUT V10 6EM5
HORIZ AFC V11 6CG7
HORIZ OSC
HORIZ OUTPUT V12 6DQ6A
HV RECT V14 1B3GT/K3GT
DAMPER V13 6DE4
LV RECT V15 5U4GB
VOLUME CONTROL
CONTRAST
BRIGHTNESS
FOCUS
PICTURE TUBE V16 21EQP4
HORIZ FREQ
HORIZ STABILIZER
HORIZ DRIVE
WIDTH
VERTICAL BLANKING CIRCUIT
VERT LINEARITY
HEIGHT
VERT HOLD
DEFLECTION YOKE
TO TUNER FRAME
TO TUNER B+
TO TUNER RF AGC
TO TUNER IF OUTPUT
TO TUNER FILAMENTS
VHF TUNER POWER PLUG & SOCKET
TO WIDTH COIL
TO PICTURE TUBE (at 14.2KV) HV ANODE 14.2KV
TO VERTICAL BLANKING CIRCUIT
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
SPEAKER CIRCUIT USED IN CHASSIS KCS127F
NON-POLARIZED
STEREO RECEPTACLE
L1n TERMINAL GUIDE
L1f TERMINAL GUIDE
L2 TERMINAL GUIDE
L2f TERMINAL GUIDE
L2l TERMINAL GUIDE
L22 TERMINAL GUIDE
TAKEN WITH VERT MULT OUTPUT (V10) REMOVED FROM SOCKET
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
TO TERMINAL 7 OF YOKE SOCKET
LENGTH OF #28 WIRE
DO NOT MEASURE
BOOST SOURCE
280V SOURCE
190V SOURCE
150V SOURCE
ADDITIONAL SCHEMATICS PAGE
TUNER KRK85D (VHF) 5
TUNER KRK72M, N (VHF) 9
TUNER KRK73N, R (VHF with UHF provisions) 20
TUNER KRK70E, F (VHF with UHF provisions) 21
TUNER KRK66AC, AG, P, AH, KRK66AC & UHF IF 9K2MR 22
TUNER KRK66D (VHF with UHF provisions) 24
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
©Howard W. Sams & Co., Inc. 1959
RCA VICTOR CHASSIS KCS127A, F, L, LX, M, MX

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

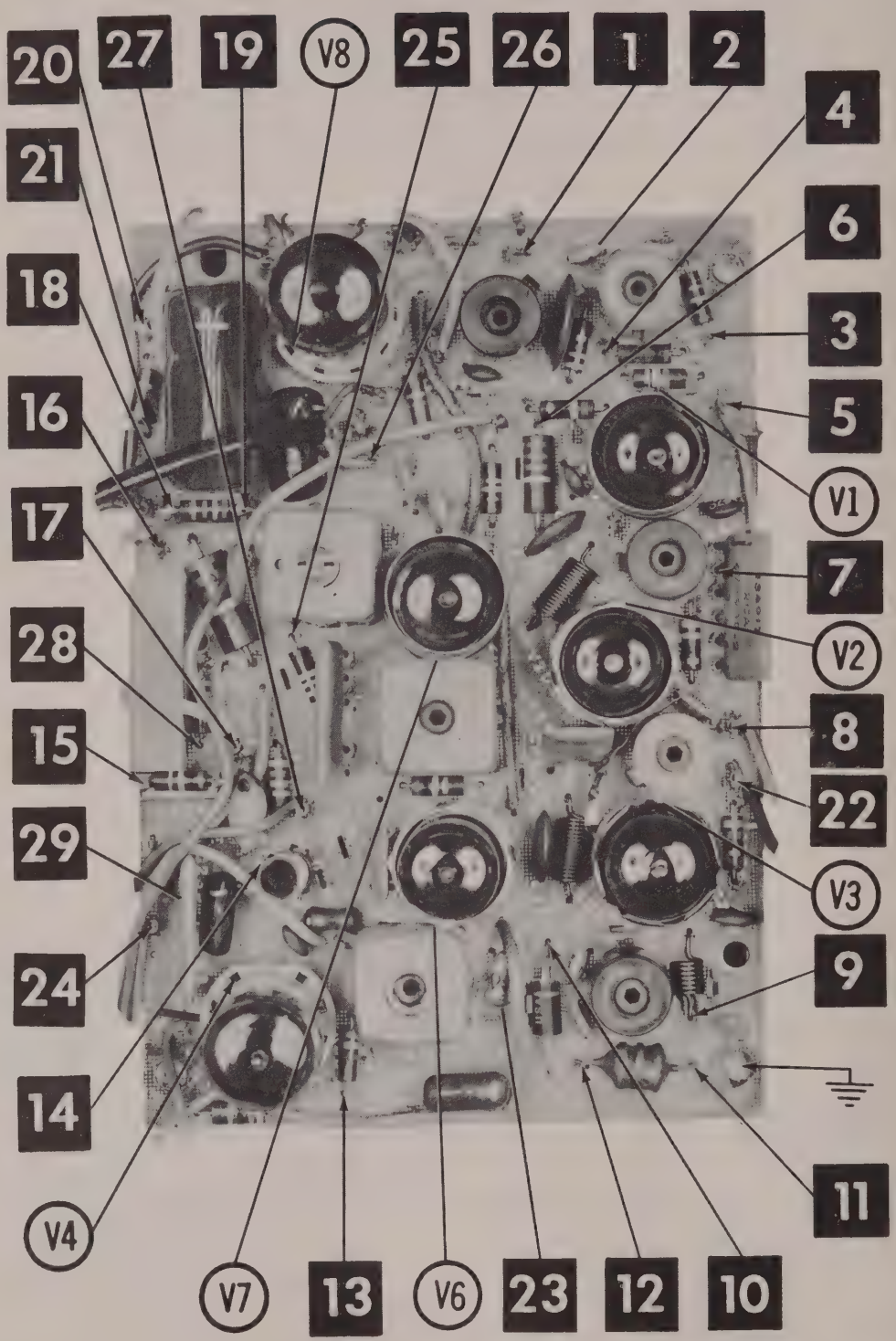
POWER SUPPLY FAILURE
No raster, no sound V15, Fuse Wires (Filament)

SWEEP FAILURE
No raster, has sound Fusible Resistor (Horiz. Swp), V11, V12, V13, V14, V16, V15
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V15, V11, V12, V13
Vert. off freq. V9
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V16
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V9
No horiz. sync V11
No vert. or horiz. sync V4, V9

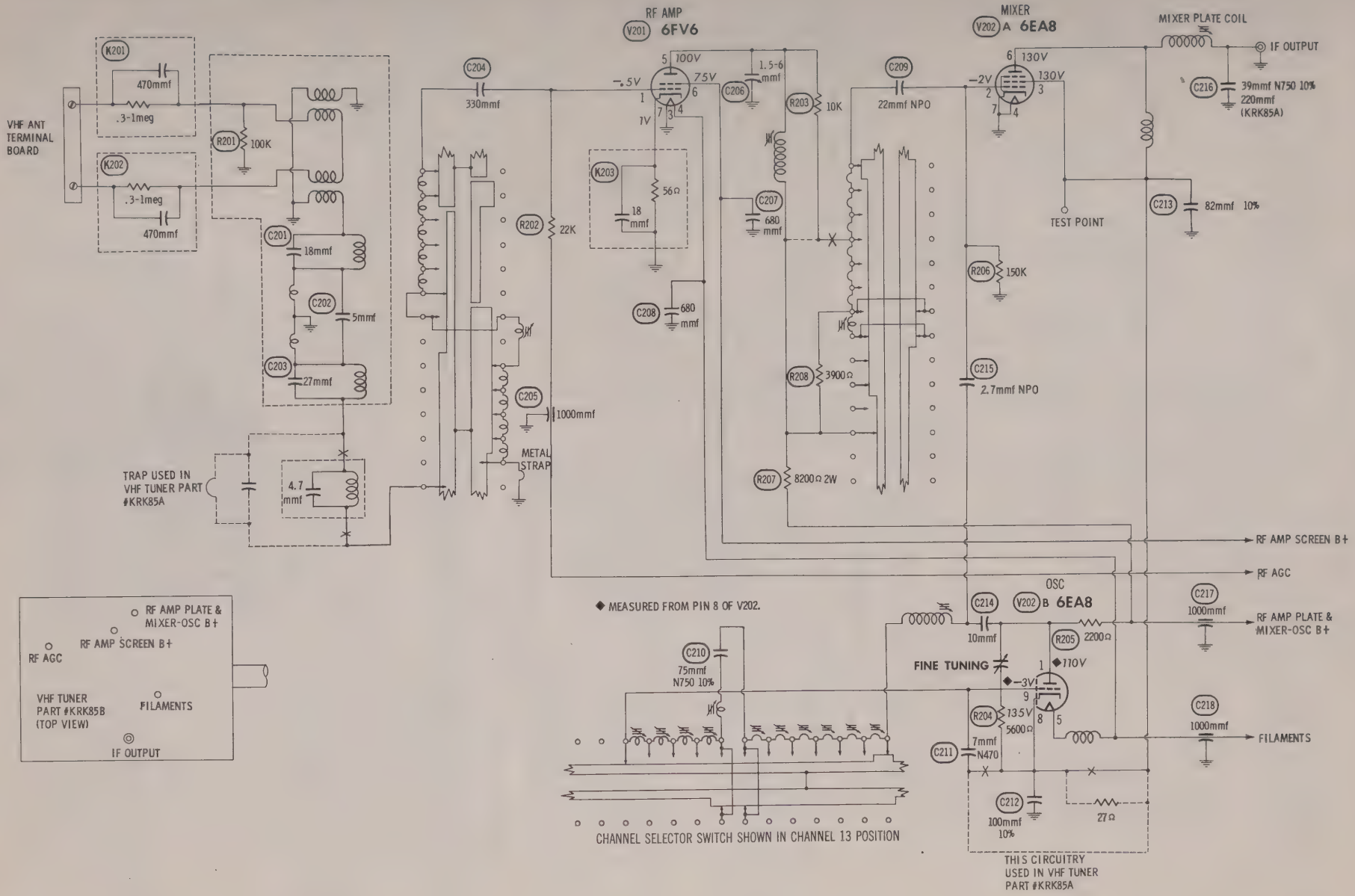
CircuiTrace Numbers 1 thru 29



A Howard W. Sams CIRCUITRACE® Photo

MAIN
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER KRK85D

F, L, LX, M, MX

RCA VICTOR CHASSIS KCS127A,

TUNER KRK85D,E,F,J

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6FV6	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6EA8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	18				DI -18	DD-180	L10Q18	CNO-418	5GA-Q18	
C202	5				NPO-DI 5	DD-050	L10V5	ZT-555	5GA-V5	
C203	27				DI-27	DD-270	L10Q27	CNO-427	5GA-Q27	
C204	330				BPD-00033	DD-331	L10T33	B-333	5GA-T33	
C205	1000				FF-001	MFT-1000			503C-D1	
C206	1.5-6					829-6		CT-552		
C207	680				BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C208	680				BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C209	22		NPO		NPO-DI 22	DTZ-22	C10Q22C	CNO-422	5TCC-Q22	
C210	75		N750 10%		N750-DI 75	DTN-75	C10Q75U		5TCU-Q75S 10%*	
C211	7		N470							
C212	100		10%		ADM-15-101 10% *	DD-101	22A5T1	CNO-310	MS-31	
C213	82		10%		ADM-15-820 10% *	DD-820	22A5Q82	CNO-482	MS-482	
C214	10				SI 10	DD-100	L10Q1	UC-541	5GA-Q1	
C215	2.7		NPO						5TCCB-V27S	
C216	39		N750 10%			TCN-39	C10Q39U	CN7-439	5TCU-Q39S 10% *	
C217	1000				EF-001	MFT-1000			503C-D1	
C218	1000				EF-001	MFT-1000			503C-D1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R201	100K			
R202	22K			
R203	10K			
R204	5600Ω			

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R205	2200Ω			
R206	150K			
R207	8200Ω	2		
R208	3900Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .3-1meg	104328	Centralab Sprague	RC-471 AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	140328	Centralab Sprague	RC-471 AC1-1
K203	RF Cath. Bypass	18mmf, 56Ω			

PRE-ALIGNMENT INSTRUCTIONS

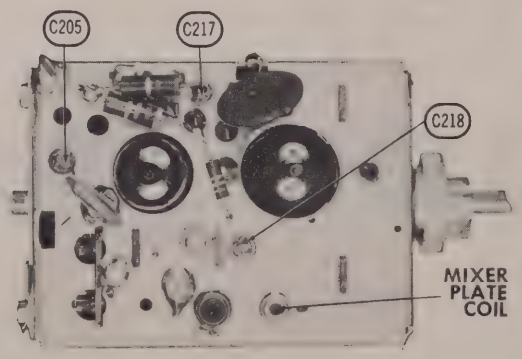
Suggested Alignment Tools: GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range. Channel 13 slug is located on top of the tuner in front of the Oscillator tube. Channel 12 thru 2 adjustments are located on the front of the tuner in a circle around the shaft. The adjustments should be made in sequence from the highest to the lowest in the area. Channel 12 adjustment is located near top of tuner. Proceed in a counterclockwise direction adjusting for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



TOP VIEW

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Disable the Horizontal Output circuit by connecting a 150Ω 10W resistor in series with the plate lead of the Horizontal Output tube. Connect the negative lead of a 12.5 volt bias supply from pin 5 (grid) of the Horizontal Output tube. Connect positive lead to chassis.

Suggested Alignment Tools:

Al thru A5, A7, A8, A9, All	GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545
A6	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A10	GENERAL CEMENT #8721, 8722 WALSCO #2519

VIDEO IF ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point Ⓐ. Positive to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1500mmf Ceramic Capacitor	High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	44.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓑ. Common to chassis. (Across Video Det. load).	A1	Adjust for maximum deflection. Adjust generator output for 3 volts on meter when finally peaked.
2.	"	"	45.5MC	"	"	A2	"
3.	"	"	43.0MC	"	"	A3	"
4.	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect a 180Ω resistor from pin 5 (plate) to pin 6 (screen) of the 1st Video IF Amp.
Couple signal generator loosely to sweep output cable to provide markers.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1500mmf Ceramic Capacitor	High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	45.0MC (10MC Swp)	42.5MC 45.75MC	4	Vert. Amp. thru demodulator probe to pin 5 (plate) of 1st Video IF Amp. Low side to chassis. Calibrate scope for 0.5 volts peak to peak.	A5, A6, & Mixer Plate Coil	Adjust Mixer Plate Coil and A5 for maximum gain, using A6 to obtain curve shape with markers as shown in Fig. 1. Remove 180Ω resistor.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across Video Det. load). Calibrate scope for 5 volts peak to peak.	A1, A2, A3	Check for response similar to Fig. 2. If necessary, retouch A1, A2 and A3 for desired response.
7.	Fig. 3	High side thru pad (Fig. 3) to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	45.75MC	"	USE VTVM DC probe to point Ⓑ. Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	1500mmf Ceramic Capacitor	Remove pad. High side to Mixer grid wafer contact thru access hole (adjacent to Mixer grid wafer) located in left side of tuner shield. Low side to chassis.	45.0MC (10MC Swp)	41.25MC	"	Leave VTVM connected. Connect scope as in step 6.	A1, A3	Retouch A1 and A3 for 1.0 to 1.5 volts on VTVM while maintaining response similar to Fig. 2.
9.	Fig. 4	Across antenna terminals thru matching network (Fig. 4).	Each VHF Channel in turn	42.5MC 45.75MC 47.25MC	All VHF Channels	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2	Check for response similar to Fig. 2. Retouch A1 and A2 SLIGHTLY to correct for tilt or other conditions that are approximately the same on all channels.

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point Ⓐ. Positive to chassis.
Set Contrast fully clockwise.
Set VTVM for negative voltage readings.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 7 (grid 3) of Audio Detector. Common to chassis.	A7, A8, A9	Adjust for maximum negative voltage on meter. Attenuate generator for a reading between 1.0 and 1.5 volts on meter when finally peaked. Peak A7 and A8 with maximum core separation. Adjust A9 for maximum deflection.
11.	Remove VTVM and diode probe. Connect scope across Volume control. Turn off signal generator and tune in the strongest TV station in the area and adjust Volume control for normal volume. Preset coil slug (A10) flush with the top of coil form. While observing scope and listening to the sound, adjust A10 clockwise to a peak. Continue turning clockwise to a second louder peak and adjust for maximum on this second peak.						

ALIGNMENT INSTRUCTIONS (cont)

4.5MC TRAP ALIGNMENT

Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (400∿ Mod)	Any non-interfering channel	Vert. Amp. thru demodulator probe to cathode of picture tube. Low side to chassis.	All	Adjust for MINIMUM 400∿ indication on scope.

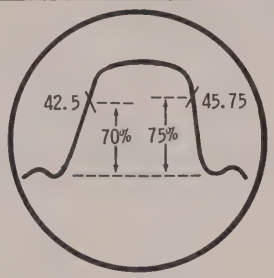


FIG. 1

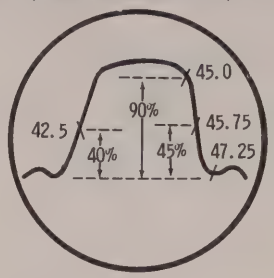


FIG. 2

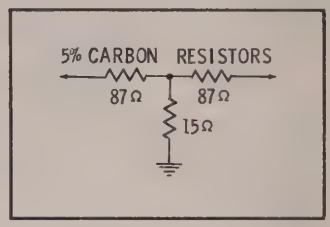


FIG. 3

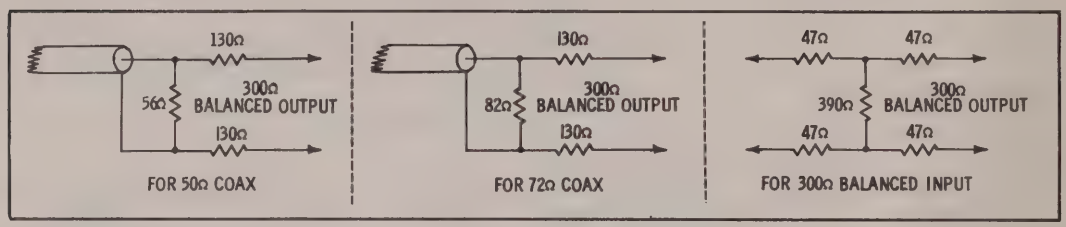


FIG. 4

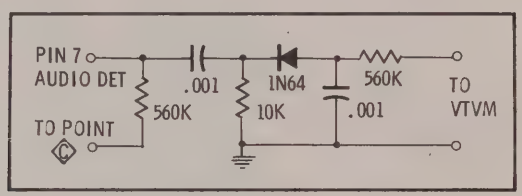
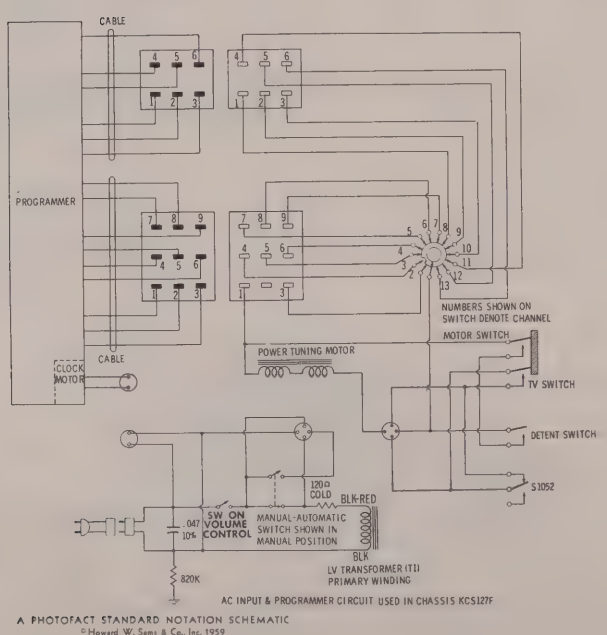


FIG. 5



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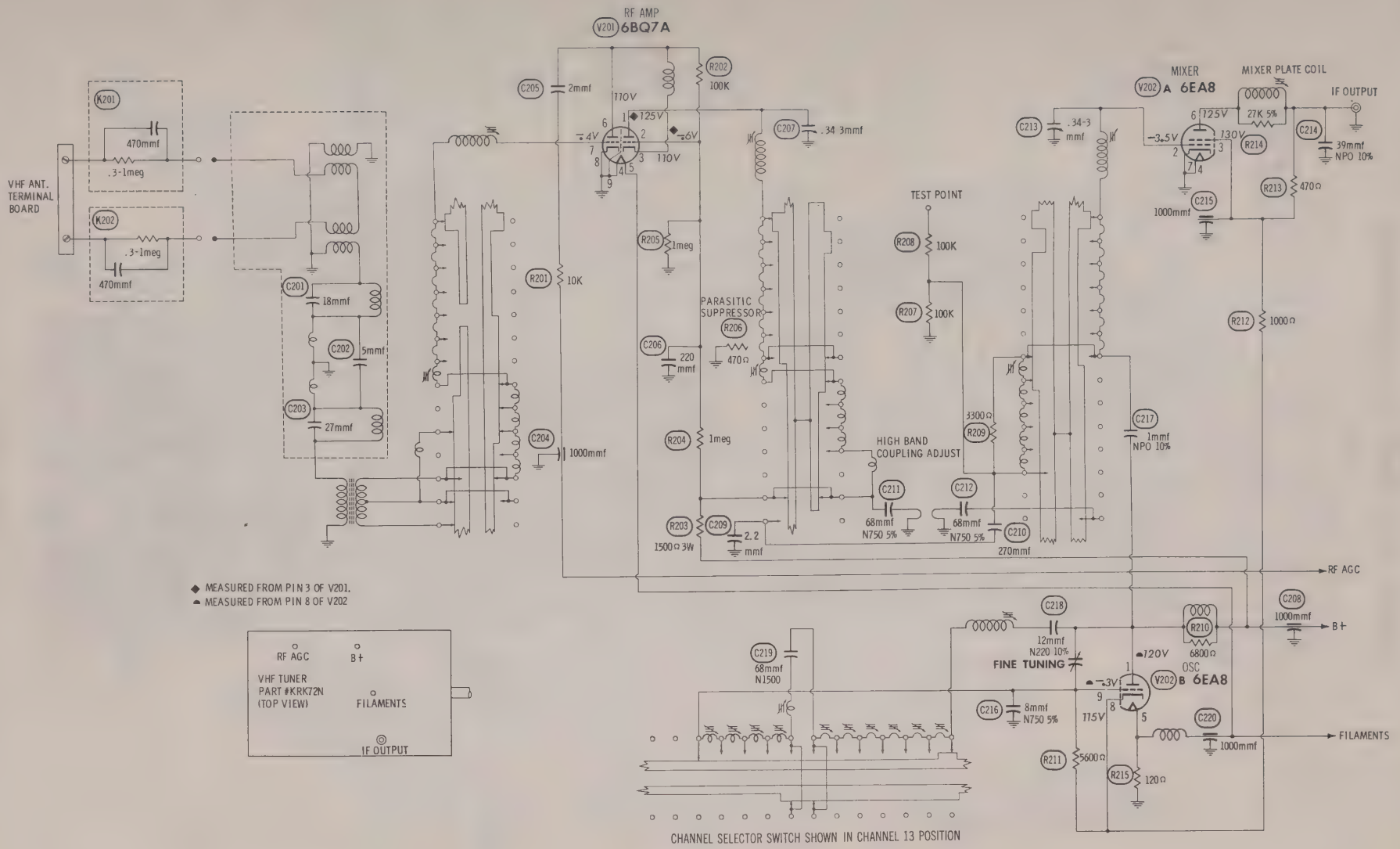

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VHF TUNER KRK72M, N, R

F, L, LX, M, MX

RCA VICTOR CHASSIS KCS127A,

TUNER
KRK 72N.
PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •		• RAYTHEON •	SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6BQ7A	V202	Mixer-Osc.	6EA8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	18				DI-18	DD-180	L10Q18	GP418	10TS-Q18	
C202	5				DI-5	DD-050	L10V5	GP550	10TS-V5	
C203	27				DI-27	DD-270	L10Q27	GP427	10TS-Q27	
C204	1000				EF-001	MFT-1000				
C205	2				NPO-SI 2	TCZ-2R2	C10V2C	CNO-522	10TCC-V22	
C206	220				DI-220	DD-221	L10T22	GP322	10TS-T22	
C207	.34-3									
C208	1000				EF-001	MFT-1000				
C209	2.2				NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	10TCC-V22	
C210	270				SI-270	D6-271	L10T27	GP327	10TS-T27	
C211	68		N750 5%			DTN-68	C10Q68U	CN7-468	10TCU-Q68	
C212	68		N750 5%			DTN-68	C10Q68U	CN7-468	10TCU-Q68	
C213	.34-3									
C214	39		NPO 10%		NPO-DI 39	TCZ-39	C10Q39C	CNO-439	10TCC-Q39	
C215	1000				EF-001	MFT-1000				
C216	8		N750 5%				C10V8U			
C217	1		NPO 10%		NPO-SI 1	TCZ-1		CNO-510	10TCC-V10	
C218	12		N220 10%						10TCE-Q12	
C219	68		N1500			TCL-68				
C220	1000				EF-001	MFT-1000				

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	10K	
R202	100K	
R203	1500Ω 3W	
R204	1meg	
R205	1meg	

ITEM No.	RATING	REMARKS
R206	470Ω	
R207	100K	
R208	100K	
R209	3300Ω	
R210	6800Ω	

ITEM No.	RATING	REMARKS
R211	5600Ω	
R212	1000Ω	
R213	470Ω	
R214	27K 5%	
R215	120Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf - .3-1meg	104328	Centralab RC-471 Sprague AC1-1
K202	Antenna Isolation	470mmf - .3-1meg	104328	Centralab RC-471 Sprague AC1-1

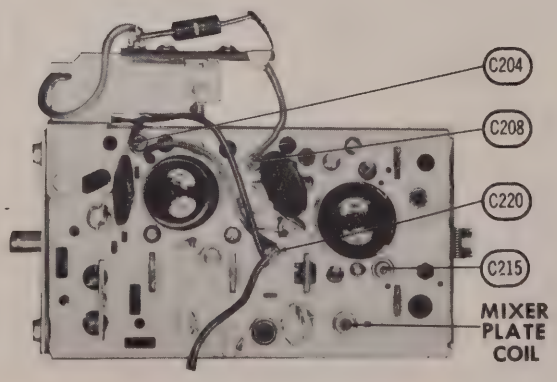
ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT

Suggested Alignment Tools: GENERAL CEMENT #8607, 9291 WALSCO #2520, 2522, 2523, 2524, 2537
Set the Fine Tuning to the center of its range for each channel adjusted. The adjustments are accessible one at a time as the Channel Selector is rotated and should be made in sequence from the highest to the lowest channel in the area. Adjust for best picture and sound.

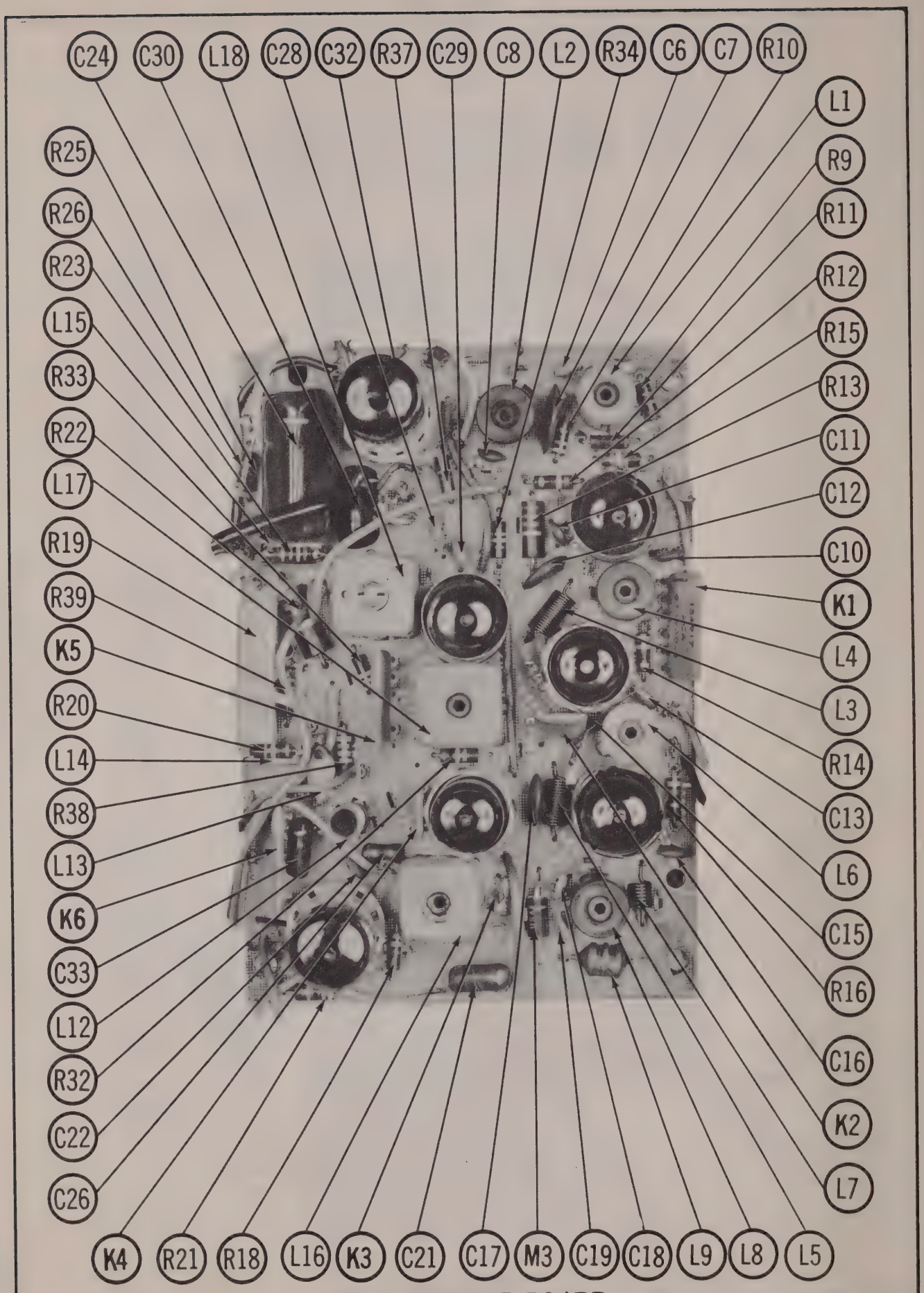
VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attemped in the field.

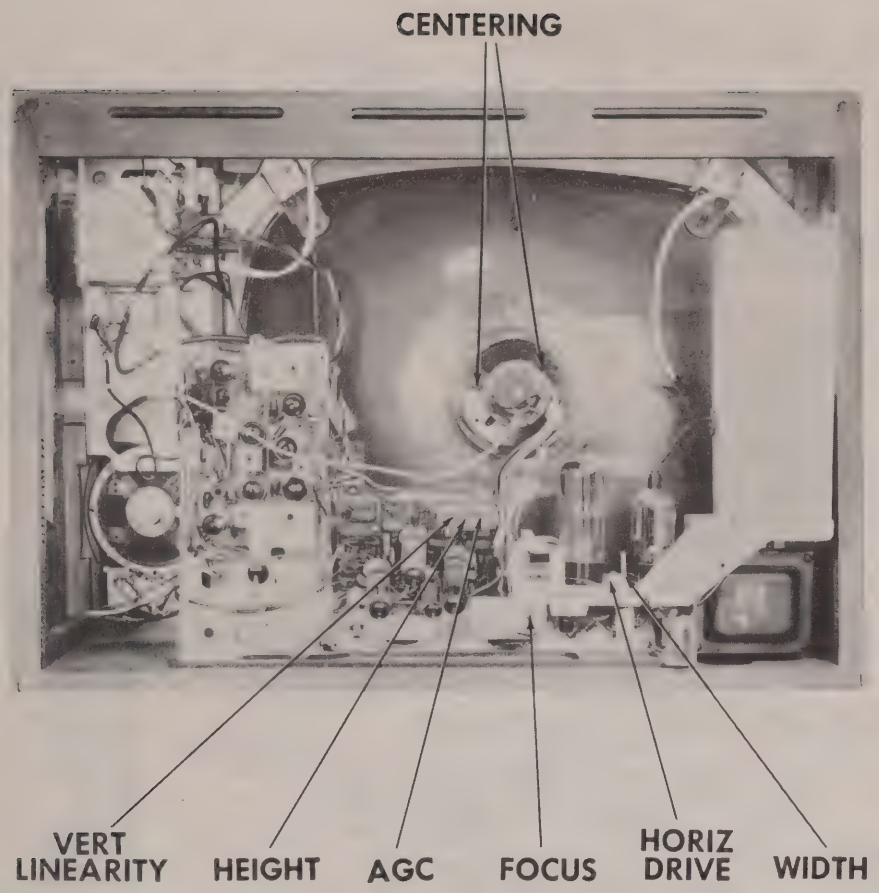


TOP VIEW

CHASSIS-TOP VIEW



MAIN PRINTED BOARD



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Before adjusting the Stabilizing slug (B1), the Horizontal Drive and Width must be properly adjusted.

Set the Horizontal Hold control to the pull-in point. Turn the Width slug (B2) fully counterclockwise and turn Horizontal Drive Trimmer (B3) counterclockwise until a bright vertical line appears near the center of the raster, then turn clockwise until the line just disappears. If no line appears, leave B3 fully counterclockwise. With the Brightness control set to normal level, adjust the Width slug (B2) for an overscan of approximately 3/4" on each side of the screen at normal line voltage. Connect a short jumper across the terminals of the Horizontal Stabilizer coil and short the grid (pin 2) of the Horizontal Oscillator to the chassis with a small screwdriver. Adjust the Horizontal Hold control for an upright picture (may appear to float back and forth across the screen). Remove the jumper from across Stabilizer coil, and adjust B1 to again obtain a picture in an upright position. When B1 is properly adjusted, alternately shorting and removing short should not cause the picture to lose sync but instead cause a slight sideways shift of the picture. Remove the short from the grid of the Horizontal Oscillator.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS — USE	TYPE	ITEM No.	GENERAL ELECTRIC — USE	TYPE
V1	1st Video IF Amp	6BZ6	V9	Asep Amp. - Vert. Mult.	6CU7
V3	2nd Video IF Amp	6BZ6	V10	Vert. Mult. - Vert. Output	6BM8
V3	3rd Video IF Amp	6BW6	V11	Horiz. AFC-Horiz. Osc.	6CU7
V4	Video Output-Sync Sep.	6BH6	V12	Horiz Output	6DQ6A
V5	AGC Keying	6AU6	V13	Damper	6DE4 Note 1
V6	Sound IF Amp	6AU6	V14	HV Rect.	1GH2T/
V7	Audio Det	6DT6			1B3GT
V8	Audio Output	6BQ6	V15	LV Rect.	5U4GB

Note 1. 6AD4GTA used in Ch. KCS127L, M.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V16	21EGP4 24BAP4		21EGP4 ① 24BAP4 ①		21EGP4 ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	100	400	107236	AFH3-158-60	C1114	FP380-1	TMT-186 TD-30-450	TVL-3819	
B	20	400							
C	10	350							
C2A	100	400	102411	AFH4-103-60	D0808	FP42L.3	TMQ-196	TVL8-4066.1*	
B	40	400							
C	20	350							
D	20	50							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	TOL	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	39000						DD-403	GP140	5HK-340	
C4	39000						DD-403	GP140	5HK-340	
C5	1.5-6			107177			820-6	ST-5515-Z		
C6	6		NPO ± .5mmf	107594		NPO-DI 8.2				
C7	100		NPO 5%	108300			DTZ-100	C10TC	CNO-310	10TCC-T10
C8	1000			77252	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C9	.47	200			P388N-47			BYA10T47	GEM-3047	2TM-P47
C10	470			78622	BPD-00047		DD-471	BYA10T47	B-347	5GA-T47
C11	1000			77252	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C12	4700			73473	BPD-0047		DD-472	BYAU4D47M	B-247	5HK-D47
C13	1000			102234A	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C14	1000			102234A	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C15	4700			73473	BPD-0047		DD-472	BYAU4D47M	B-247	5HK-D47
C16	1000			102234A	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C17	4700			73473	BPD-0047		DD-472	BYAU4D47M	B-247	5HK-D47
C18	7		NPO ± .5mmf	104177	NPO-DI 6.8		DTZ-6R8	C10YTC	CNO-568	10TCC-V6.8
C19	8		NPO ± .5mmf	104178	NPO-DI 8.0		DTZ-6R7	C10YSC	CNO-547	10TCC-V80
C20	1000			102234A	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C21	.0047	600	10%		V84C6D47-10%			P36D47	GP247	6TM-D47
C22	12		10%	103345	DI-12		DD-120	L10Q12	GP412	10TS-Q12
C23	47		10%	103824	DI-47		DD-470	L10Q47	GP447	10TS-Q47
C24	.22	600			P688N-33			CUB6P22	GEM-6033	6TM-P33
C25	470		10%	102330	DI-470		DD-471	SR37T47	GP347	10TS-T47
C26	3	1000	eliminf	104304				C10Y3C	ST-483	10TS-Y33
C27	2700		10%	104151		DI-2700		P36D3		10TS-D27
C28	1000			102234A	BPD-001		DD-102	BYA10D1	B-210	5HK-D10
C29	680		10%	104135		DI-680		1B3T68	GP368	1TS-D68
C30	.047	200			P288N-047		DD-503	CUB2S47	GEM-4147	2TM-S47
C31	.01	400			P488N-01		DE-103	CUB4S	GEM-441	4TM-S
C32	.0047	1000	10%						GEM-16247	10TM-D47
C33	.0033	600	10%		V84C6D33-10%			P36D33	GEM-16233	6TM-D33
C34	.033	400			P488N-033			CUB4S33	GEM-4133	4TM-S33
C35	220		10%	104144	1468-00032K		DD-221	22ST22	MCB227	MS-222
C36	.0082	400	10%		P684CM-00 82				GEM-16262	6TM-D8
C37	.01	400	10%		V84C4S1-10%			PM4P1	GEM-1611	4TM-S1
C38	.0068	400	10%						GEM-16268	10TS-D68
C39	.039	400	10%		P684CM-039			P36S94	GEM-1614	4TM-S4
C40	.012	400	10%						GEM-1612	4TM-S2
C41	.15	200	10%		V84C3P15-10%			PM3P15	GEM-3015	2TM-P15
C42	.022	600			P688N-022			CUB6S22	GEM-6122	6TM-S22
C43	.01	400	10%		V84C4S-10%			PM4S	GEM-1611	4TM-S
C44	.027	600	10%		P684CM-027			P36D9	GEM-1613	6TM-S3
C45	1000	2000	10%	104222						
C46	.047	400			P488N-047		DD-503	CUB4S47	GEM-4147	4TM-S47
C47	33		NPO 10%	103848	NPO-DI 33		DTZ-33	C10Q33C	CNO-433	10TCC-Q33
C48	.022	200			P288N-022			CUB2S22	GEM-4122	4TM-S22
C49	.47	200			P288N-47			CUB2S47	GEM-3047	2TM-P47
C50	.47	200			P288N-47			CUB2P47	GEM-3047	2TM-P47
C51	470	1000	5%	103672	1468-HV-0004U				MCB381	MS-382
C52	220		N750 10%	103645	N750-DI 220		DTN-220	C10T22U	CNT-322	10TCU-T22
C53	270		10%	107323	DI-270		DD-271	L10T27	GP327	10TS-T27
C54	680		10%	106980	1468-00081K		DD-331		MCB381	MS-382
C55	680		N3300	109518						
C56	.01	400	10%		V84C4S-10%			PM4S	GEM-1611	4TM-S
C57	30-180			109849						
C58	.1	600			P688N-1		DF-104	CUB6P1	GEM-601	6TM-P1
C59	.027	200	10%		P684CM-027			PM6S3	GEM-1613	6TM-S3
C60	.1	600			P688N-1		DF-104	CUB6P1	GEM-601	6TM-P1
C61	.1	600	10%		V84C6P1-10%			PM6P1		6TM-P1
C62	180	2500	10%	103836						
C63	82	3000	10%							
C64	180	2500	10%	103836						
C65	330	3000			HVD-30-330	DD30-331		HVB20T33	2HV-333	30GA-T33
C66	560	3000	10%							
C67	00082	1600	10%						MCB381	
C68	.039	400	10%		P584CM-039			PM6S4	GEM-1614	4TM-S4
C69	.047	600	10%		V84C6S47-10%			PM6S47	GEM-1615	6TM-S47

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	107286				PPR5T25	Volume, Tap ② 200K ①
B	Switch							Push-Pull Off-On
R2	30K	½	107290					Contrast, Tap ② 25K ③
R3	40K	½	107292					Horiz. Hold
R4A	200K	½	107231	AB-46	A47-200K-S	Q11-129	U42	Brightness
B	Shaft			AK-5	R5-3/16	NQ	D5-37	
R5A	1.5meg	½	107233	AB-743	A47-1.5meg-S	Q11-128	U165	Vert. Hold
B	Shaft			AK-5	R5-3/16	NQ	D5-37	
R6A	300K	.2	107297					AGC
B	4meg	.2						Height
C	1.5meg	.2						Vert. Linearity
D	100K	.2						AGC Bo- Coupling
E	47K	.2						AGC Grid Filter
F	1meg	.2						Vert. Mult Plate Load
G	680K	.2						Vert. Linearity Coupling
H	470K	.2						Vert. Output Grid
I	1meg	.2						Vert. Linearity Limiter
R7A	5meg	½	107294	AB-87	B47-5meg-S	B11-141	PTA56L	Focus
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

① Chassis KCS127F, L, LX, M, MX use Part #107446.
② Chassis KCS127L, LX, M, MX use Part #107506.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	820Ω 1W	
R9	15K 5%	
R10	4700Ω 8%	
R11	1000Ω	
R12	68Ω 5%	
R13	1300Ω 1W	
R14	33Ω 5%	
R15	180K	
R16	470Ω	
R17	3900Ω	
R18	330Ω	
R19	6800Ω 5W	#107035
R20	10K	
R21	47Ω	
R22	18000 2W	
R23	6800Ω	
R24	470K	
R25	120K	
R26	1meg	
R27	100K	
R28	2.2meg	
R29	180K	
R30	220K 1W	
R31	3300Ω	
R32	100K	

ITEM No.	RATING	REMARKS
R33	470K	
R34	560K	
R35	47K	
R36	2200Ω 4W	#103363
R37	220Ω	
R38	47K	
R39	68K	
R40	33K	
R41	560K	
R42	10K 1W	
R43	3700Ω	
R44	39K	Note 1
R45	18K	
R46	6 6meg	
R47	8200Ω	
R48	68K	
R49	18K	
R50	22K 5%	
R51	3900Ω	
R52	18K 1W	
R53	3300Ω	
R54	220Ω 4W	#107048
R55	2200Ω	
R56	470K 1W	
R57	330K	

ITEM No.	RATING	REMARKS
R58	180K 8%	
R59	68K 1W	
R60	56K 5%	
R61	270K	
R62	3300Ω	
R63	1meg	
R64	47Ω	
R65	8200Ω 2W	Note 2
R66	1000Ω 7W	
R67	470K	
R68	1Ω 5%	#104382 Note 3
R69	10000Ω	
R70	4700Ω	
R71	150Ω	
R72	150Ω	
R73	3.5Ω COLD	#107464
R74	120Ω COLD	#107191
R75	620K	
R76	12.5Ω	#104295
R77	2700Ω 7W	#102789A
R78	18000 2W	
R79	18K 2W	
R80	2.2meg	

Note 1. Ch. KCS127L, LX, M, MX use 82K in this application.
Note 2. Ch. KCS127L, LX, M, MX use 8500Ω 2W in this application.
Note 3. Ch. KCS127L, LX, M, MX use .68Ω in this application (Part #93468).
RCA Victor Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No	REPLACEMENT DATA
K1	Video IF Decoupling	1000mmf, 1000mmf, 220Ω, 220Ω, 15K, 150K, 150K	107277	
K2	Video IF Cathode	4700mmf, 120Ω	107279	
K3	Sound IF Grid	56mmf, 47K	104329	Sprague PRC-1
K4	Sound IF Cathode	10000mmf, 82Ω	107278	
K5	Sound IF Decoupling	10000mmf, 10000mmf, 560Ω, 2200Ω, 4700Ω	107276	
K6	Sync Sep. Grid	150mmf, 270K, 2.2meg, 2.7meg	107200	
K7	Sync Amp. Grid	560mmf, 27K	107492	
K8	Vert. Blanking	4700mmf, 22K	107283	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No.	NOTES
L1	1st Video IF	107202						
L2	47.25MC Trap	107203						
L3	Fil. Choke							
L4	2nd Video IF	104353						
L5	Fil. Choke							
L6	3rd Video IF	107204						
L7	RF Choke							
L8	4th Video IF	104333						
L9	Series Peaking Coil	101819	19-3036	19-3036	TV-180	6176	VP-1	36uh
L10	Shunt Peaking Coil	101287	19-3350	19-3350	TV-185	6181	VP-8	250uh
L11	RF Choke	107462			SW-630			2.7uh
L12	4.5MC Trap	104903						
L13	Shunt Peaking Coil	101818	19-3036	19-3036	TV-180	6176	VP-1	36uh
L14	Series Peaking Coil	107199			TV-307	6186		750uh
L15	Series Peaking Coil	104330	19-3300	19-3300	TV-199	6185		300uh
L16	1st Sound IF	104136						①
L17	2nd Sound IF	107201						②
L18	Quadrature Coil	105795						③
L19	RF Choke	107388						④
L20	RF Choke	107385					4529	4.7uh ③
							4529	4.7uh ④

① Includes 39mmf cap. ② Includes 12mmf caps. ③ Includes 10mmf cap. and 120K resistor. ④ IRC Part #CL-1.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI.	DC RES: SEC.	REPLACEMENT DATA: RCA Victor PART No.	Haldorson PART No.	Merit PART No.	Miller PART No.	Rom PART No.	Thordarson PART No.	NOTES
L21A	84Ω		107284						Horiz. Osc. Tapped ② 24Ω Horiz. Stabilizer
B	44Ω								

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Haldorson PART No.	Merit PART No.	Miller PART No.	Rom PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L22	Width Coil Prl. (1.8-11MΩ) Sec. (.01-.1MΩ)	106320								

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(a)	REPLACEMENT DATA: RCA Victor PART No.	Haldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L23	.280A	40Ω	1.3 Hy.	77676	28C44	C-3296 ①		C-3238 ①	28C44	C-28X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: RCA Victor PART No.	Haldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	580VCT	5V	107277						
	② 1.9A	② .280A	② 3A							
	SEC. 3	SEC. 4	SEC 5							
	6.3V									
	② 9.2A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	Haldorson PART No.	Merit PART No.	Rom PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	107327	26S14		V318		26S14	26S14	A-115X
T3	Yoke-Horiz (18.5MH)	107022A	Y-47		Y-111		DY-26A	Y-47	Y-60 &
	(110°)-Vert. (12.7MH)	① ②	④		④		③		NW-25 ③
	Alt. Yoke	107666 ③							
	Rear Cover & Centering Device	107192							
T4	Horiz. Output	107422 ②	FLY-150 ③ *	HVO-116 * ③	X066 ① *		HO-389 ③ *	FLY-150 ③ *	D-139 ③ *
	Alt. Horiz. Output	107898 ③							

① Includes R71, R72, R73, C62, C63, C64 and yoke plug.
② Used in Ch. KCS127A, B, and F.
③ Used in Ch. KCS127L, LX, M, and MX.
④ Use original rear cover, centering device and yoke clamp.
⑤ Use original yoke plug and connect same as original.
⑥ Drill new mounting hole.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Haldorson Replacement Connections	Merit Replacement Connections	Rom Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5		5	5	5
4	4	4	4		4	4	4
3	3	3	3		3	3	3
2	2	2	2		2	2	2
1	1	1	1		1	1	1
Connect Width Coil Across	2 & 1	2 & 1	2 & 1		2 & 1	2 & 1	2 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: RCA Victor PART No.	Haldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	7600Ω	3-4Ω	100637	26S48	A-3020	AU-804	A-3849	26S48	S-9Z	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3-4Ω	104861	5A07	Models 2107195, 6, 9
	8"	PM		107475		Models 210KA465, 6, 340K495, U, X, XU, 340K496, X, 7, X
	31"	PM		102219		Models 210KA465, 6

RCA VICTOR CHASSIS KCS127A, F, L, LX, M, MX

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	2" length #28 wire							
M2	2" length #28 wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		RCA Victor PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N60	76675B	1N60	1N60	1N60	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M4	Tuner	KRK72N	VHF Ch. KCS127A
	Tuner	KRK72M	VHF Ch. KCS127F
	Tuner	KRK85D	VHF Ch. KCS127LX
	Tuner	KRK70E	VHF with UHF provisions, Ch. KCS127L, M
	Tuner	KRK73N	VHF with UHF provisions, Ch. KCS127B
	Tuner	KRK86D	VHF with UHF provisions, Ch. KCS127MX
	Tuner	KRK66AC	UHF Ch. KCS127B
	Tuner	KRK66AD	UHF Ch. KCS127M
	Tuner	KRK66P	UHF Ch. KCS127MX
	Printed Board	107346	Main, Less Tubes
	Printed Board	107466	Sweep, Less Tubes, Ch. KCS127A, B, F
	Printed Board	107347	Sweep, Less Tubes, Ch. KCS127L, LX, M, MX

CABINETS & CABINET PARTS

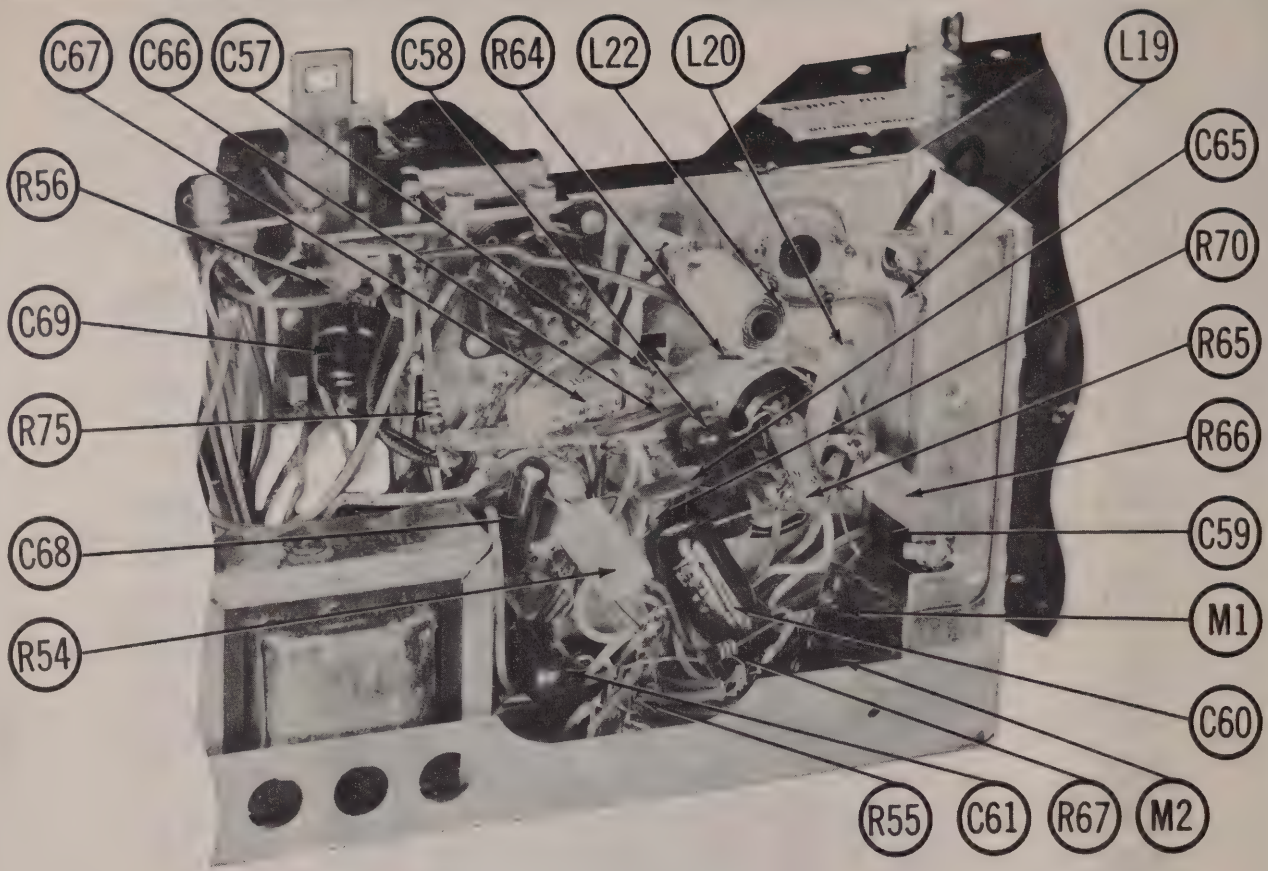
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	107665	Models 240K495, U, X, XU, 240K496, X, 7, X
Safety Glass	107427	Models 210T195, 6, 9
Safety Glass	107655	Models 210KA465, 6
Mask	107660	Models 210KA465, 6
Mask	105564	Models 240K495, U, X, XU, 240K496, X, 7, X
Mask	107426	Models 210T195, 6, 9
Knob	107372	VHF Channel Selector and Dial Assy.; Models 210T195, 6, 9
Knob	106099	VHF Channel Selector, Models 240K496, X
Knob	106526	VHF Channel Selector, Model 210KA465
Knob	106098	VHF Channel Selector, Models 240K495, U, X, XU
Knob	107491	VHF Channel Selector, Models 240K497, X
Knob	107654	VHF Channel Selector, Model 210KA466
Knob	102653	UHF Channel Selector, Models 240K495U, XU
Knob	106596	Fine Tuning, Models 210T195, 6, 9
Knob	107486	Fine Tuning, Models 210K496, X
Knob	106529	Fine Tuning, Model 210KA465
Knob	107485	Fine Tuning, Models 240K495, U, X, XU
Knob	107583	Fine Tuning, Model 210KA466
Knob	107487	Fine Tuning, Models 240K497, X
Knob	106102	UHF Dial, Models 240K495U, XU
Knob	107264	Off-On-Volume, Contrast, Models 210T195, 6, 9
Knob	107483	Off-On-Volume, Contrast, Models 240K496, X
Knob	107482	Off-On-Volume, Contrast, Models 210KA465, 240K495, U, X, XU
Knob	107484	Off-On-Volume, Contrast, Models 210KA466, 240K497, X
Knob	107488	Brightness, Models 210KA465, 6, 240K495, U, X, XU, 240K496, X, 7, X
Knob	107265	Brightness, Vert., Horiz., Models 210T195, 6, 9
Knob	107490	Vert., Models 210KA465, 6, 240K495, U, X, XU, 240K496, X, 7, X
Knob	107489	Horiz., Models 210KA465, 6, 240K495, U, X, XU, 240K496, X, 7, X
Knob	107584	Fringe Clarity Switch, Model 210KA465
Knob	107586	Fringe Clarity Switch, Model 210KA466
Cabinet	M4640	Models 240K495, U, X, XU
Cabinet	M4641	Models 240K497, X
Cabinet	M4642	Models 240K496, X
Cabinet	X4617	Model 210KA465
Cabinet	X4618	Model 210KA466
Cabinet	X4573	Model 210T195
Cabinet	X4575	Model 210T197
Cabinet	X4574	Model 210T196
Escutcheon	101116	Channel Indicator, Model 210KA465, 6
Escutcheon	107657	Channel Programmer, Model 210KA465, 6
Escutcheon	106512	Fine Tuning, Models 210KA465, 6, 210T195, 6, 9

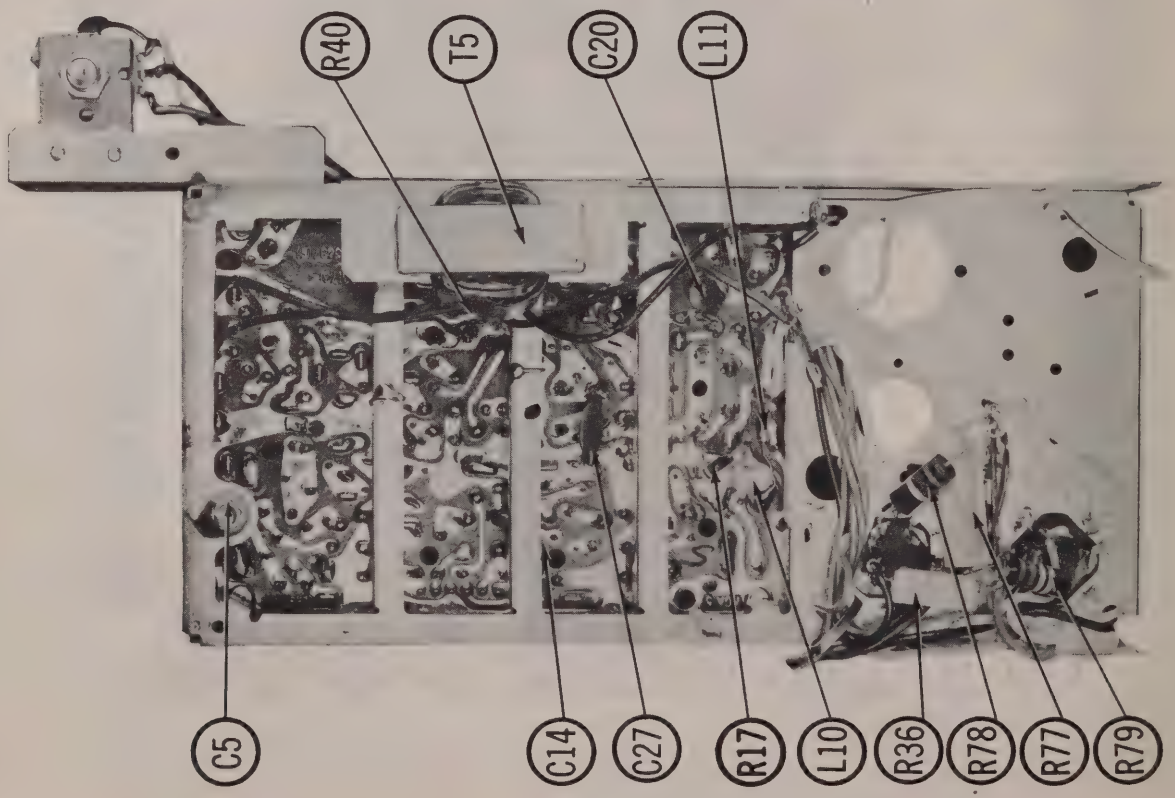
WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

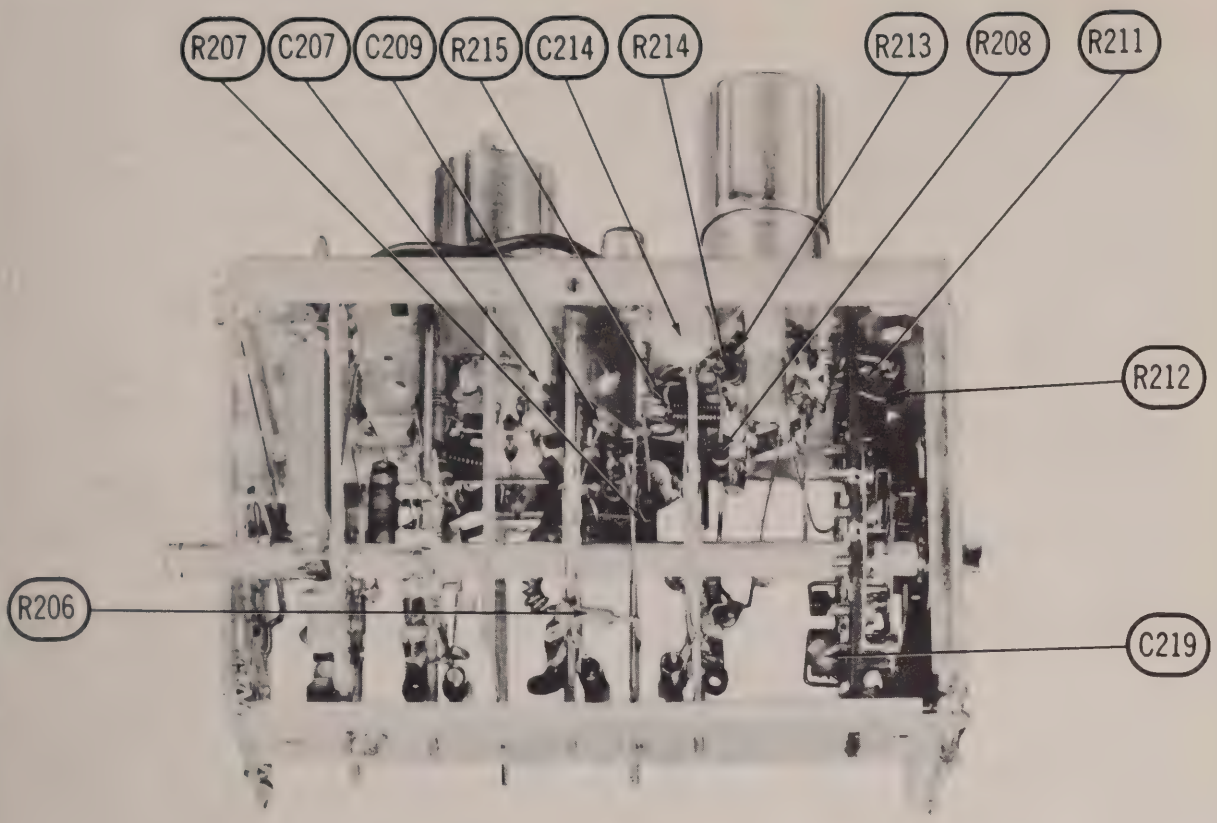
SWEEP PRINTED BOARD



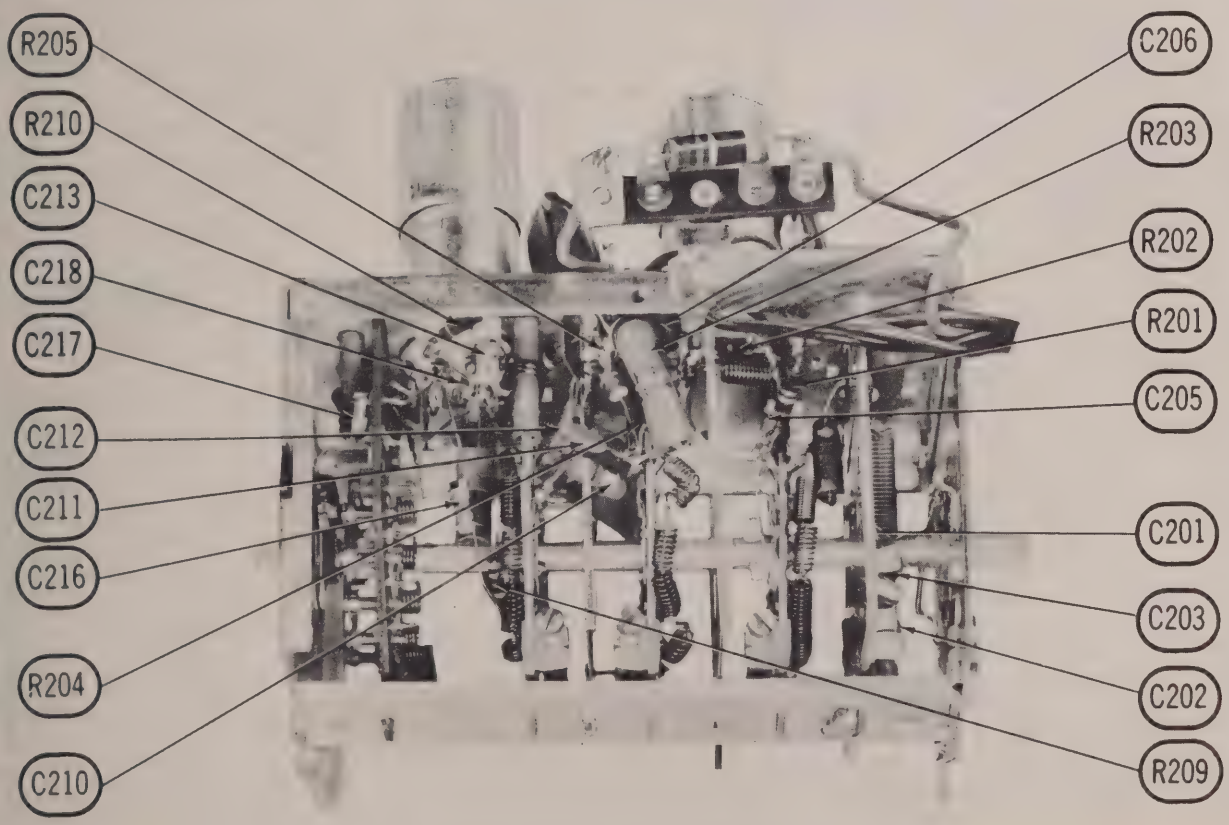
CHASSIS - BOTTOM VIEW



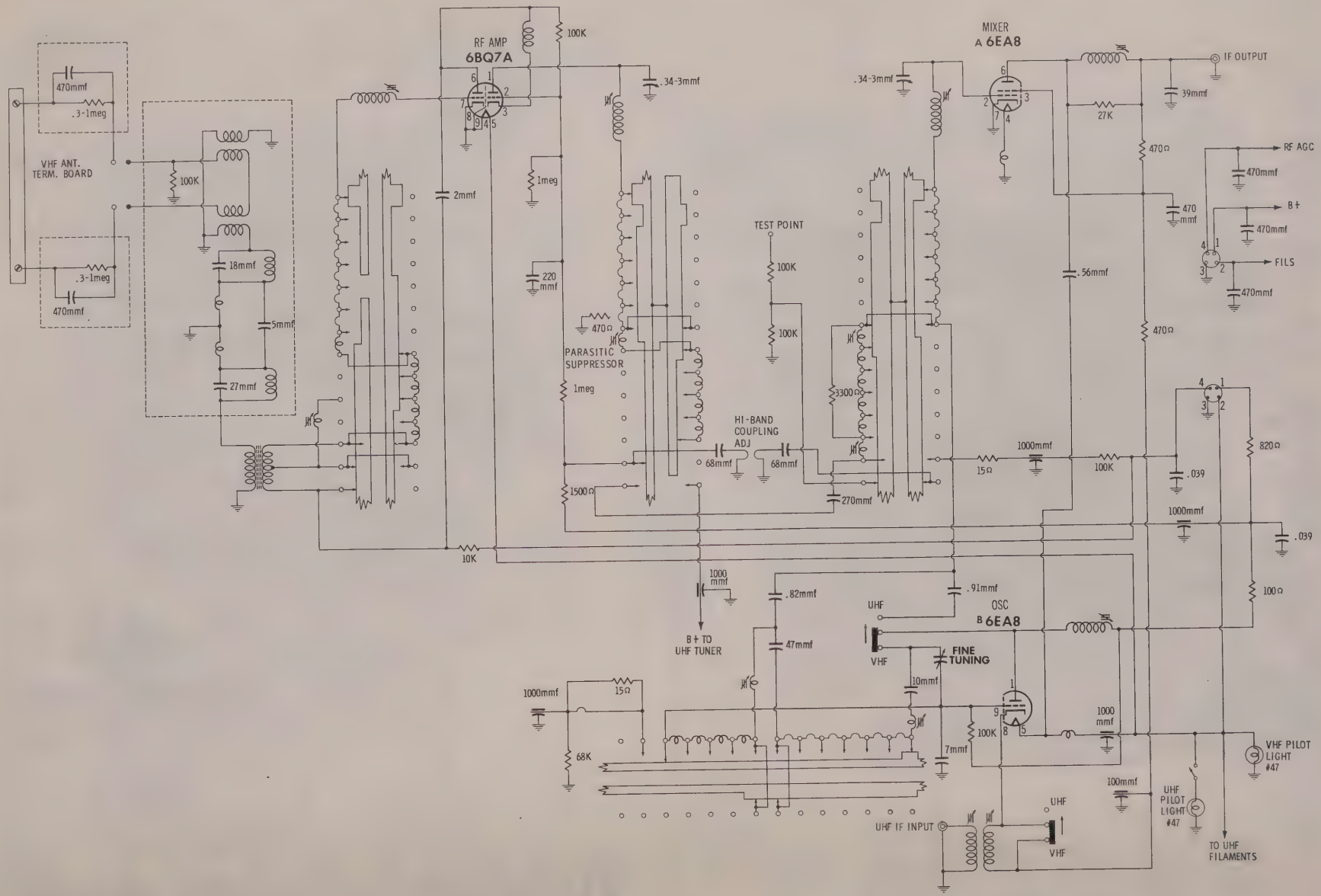
VERTICAL CHASSIS - BOTTOM VIEW



TUNER KRK72N - LEFT SIDE



TUNER KRK72N- RIGHT SIDE



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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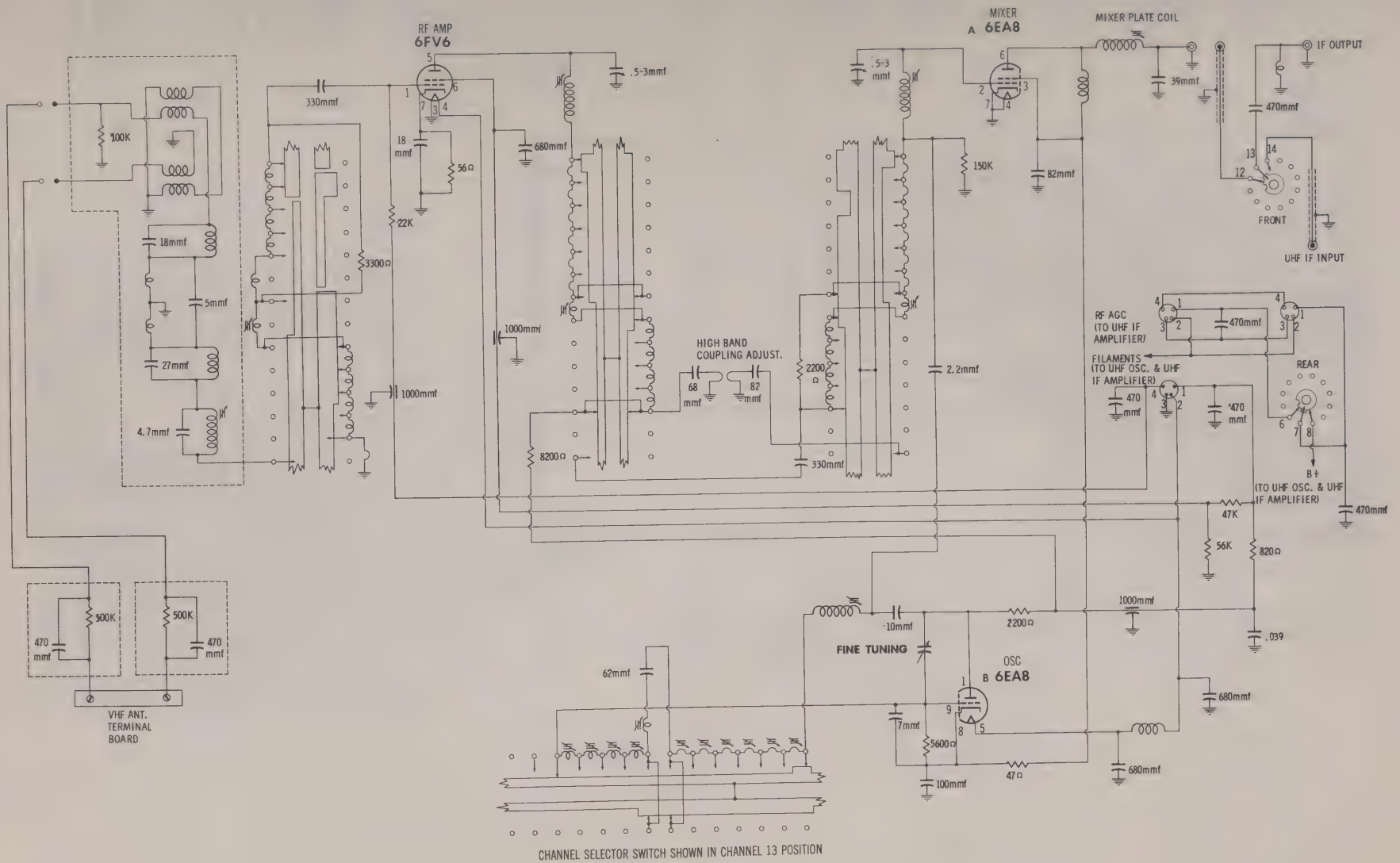
VHF TUNER with UHF provisions KRK73N, R



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

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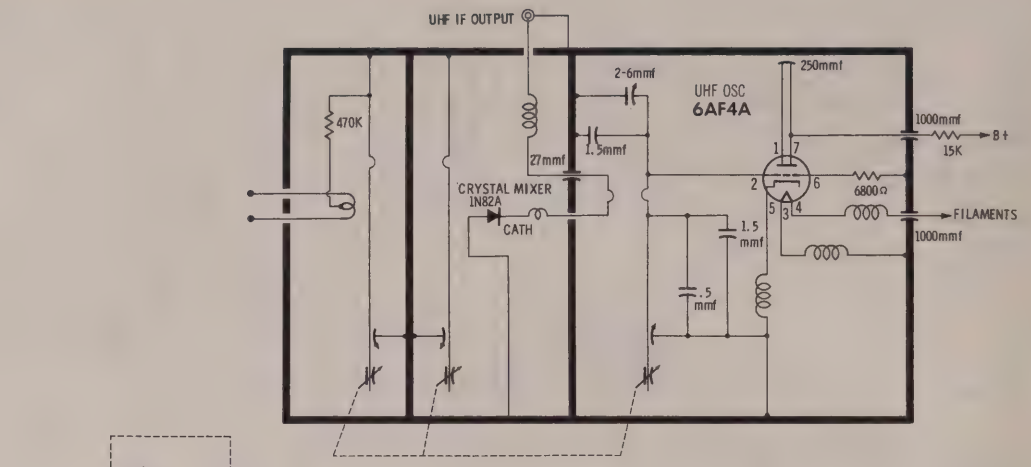
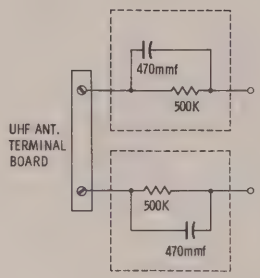
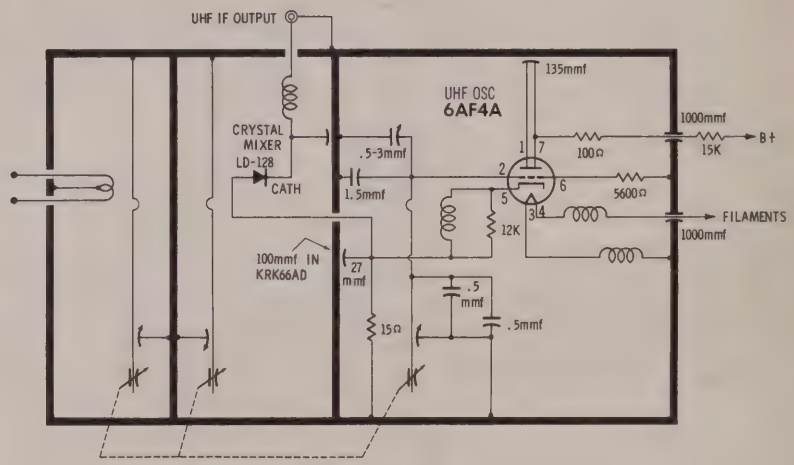
VHF TUNER with UHF provisions KRK70E, F

RCA VICTOR CHASSIS KCS127A,
F, L, LX, M, MX

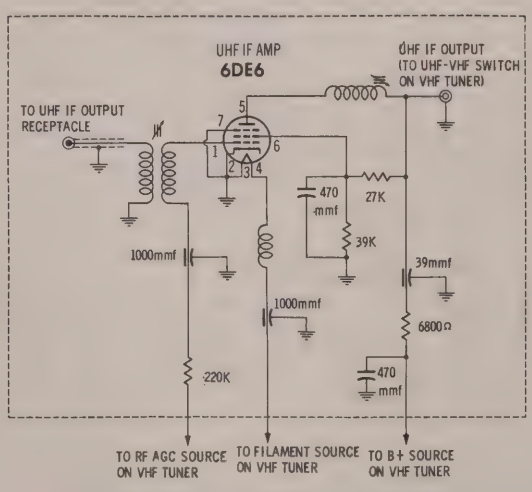


KRK66AC (962048)

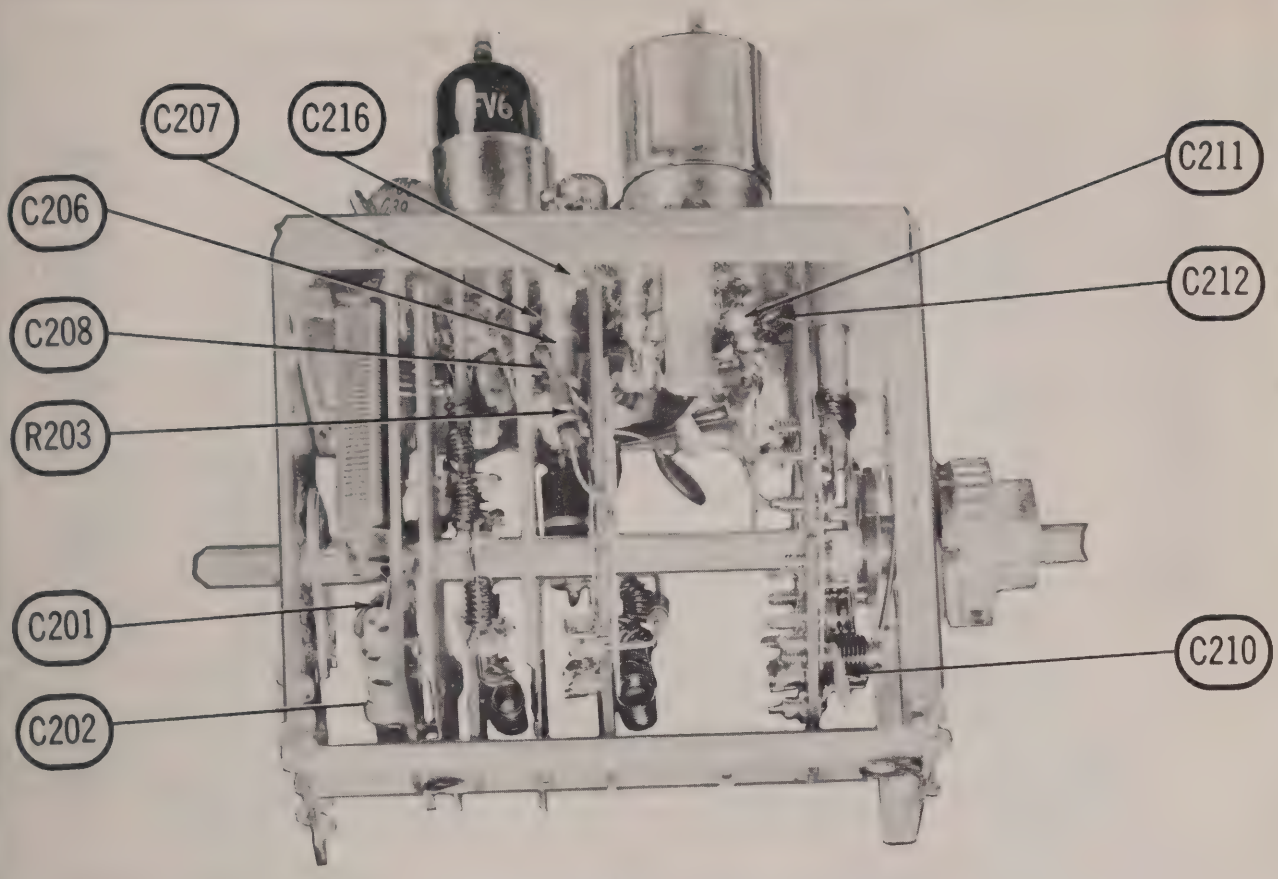




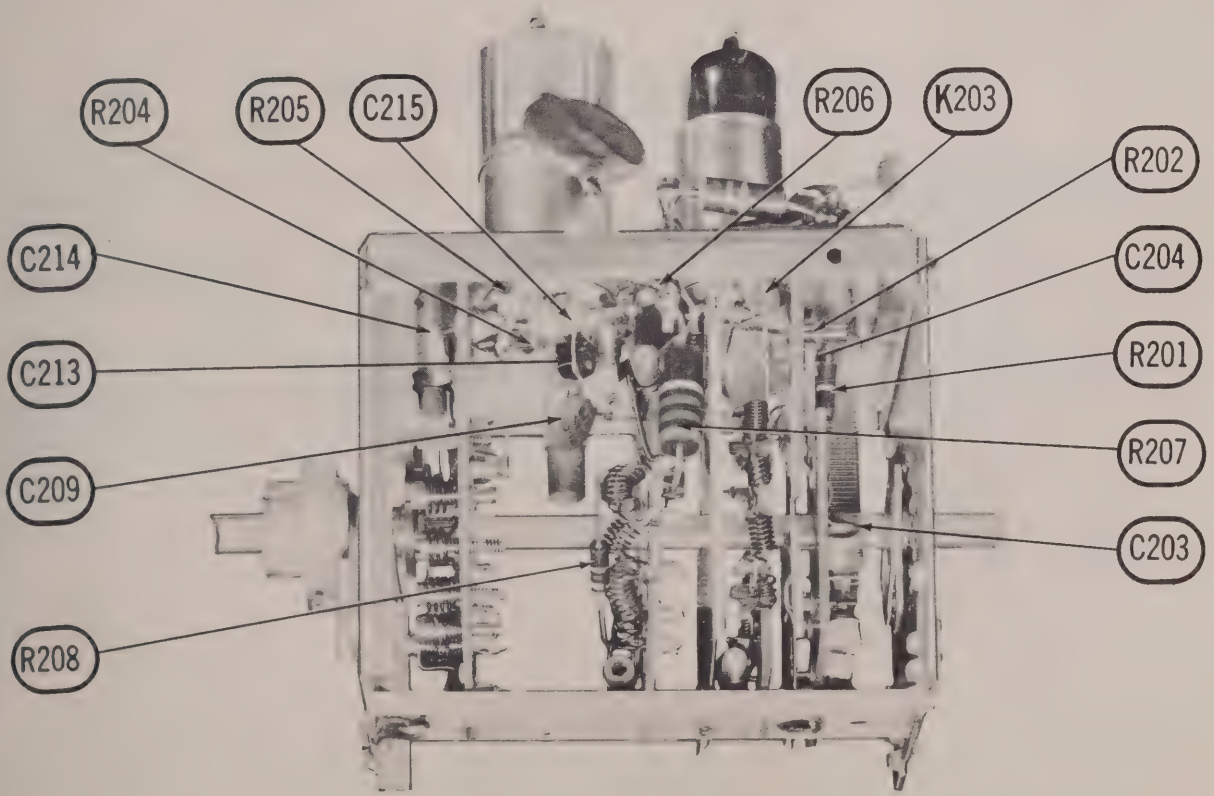
KRK66AC, AD, P (962047)



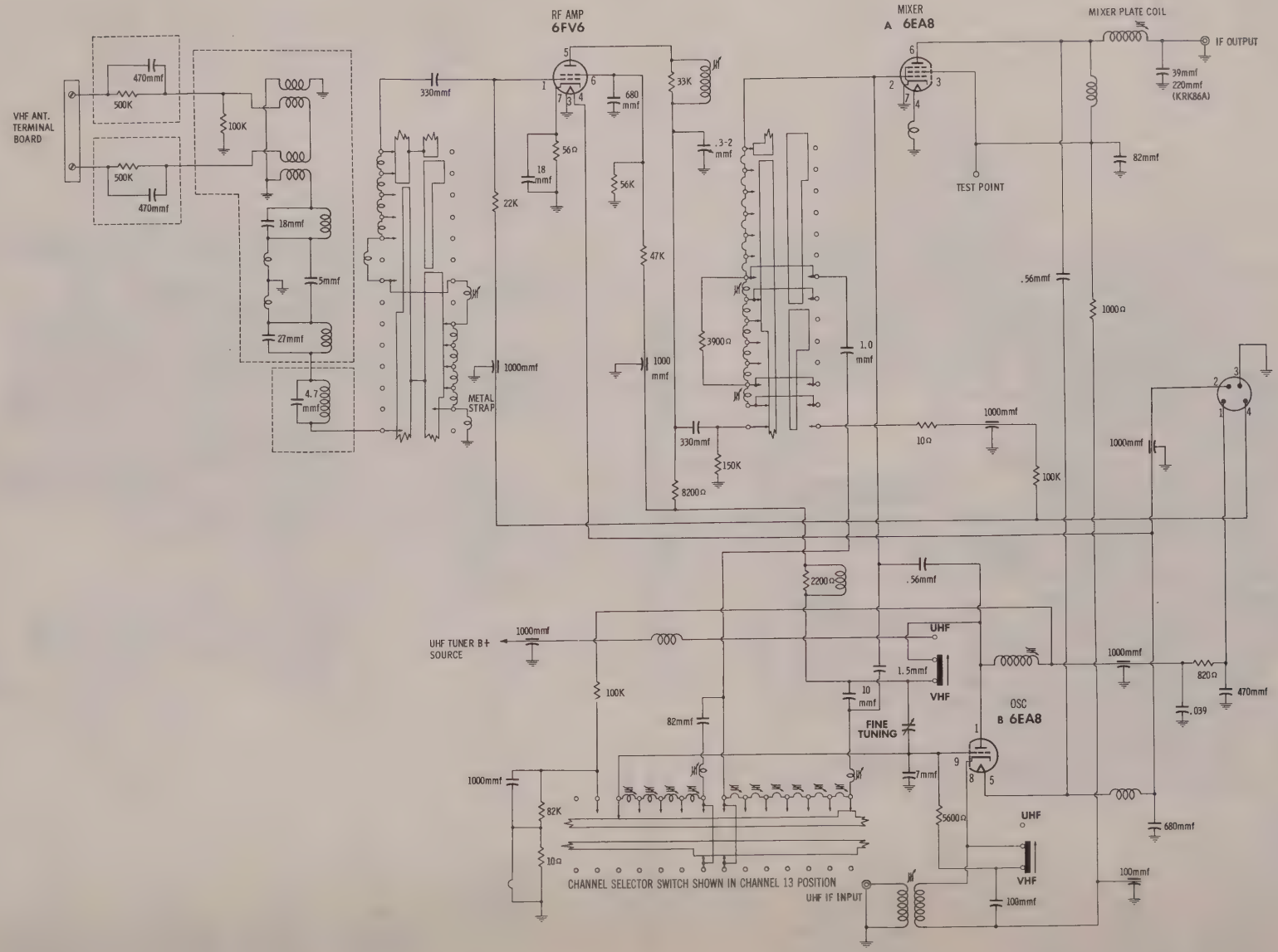
962349



TUNER KRK85 - LEFT SIDE



TUNER KRK85 - RIGHT SIDE



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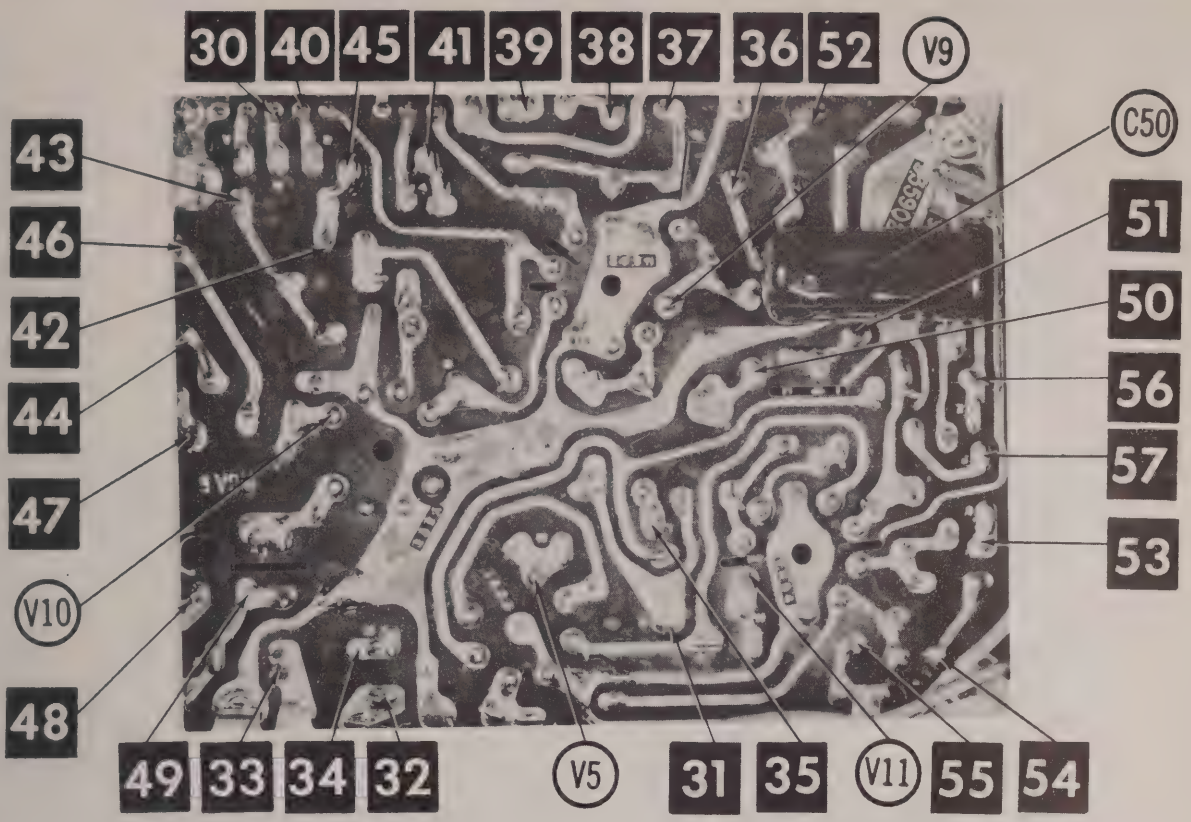
VHF TUNER with UHF provisions KRK86D

CIRCUITRACE NOS 30–37



A Howard W. Sams CIRCUITRACE Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

SWEEP PRINTED BOARD

MISCELLANEOUS ADJUSTMENTS

PROGRAMMER SET-UP

The Manual/Automatic function switch must be set on "Automatic" to use the programming function.

There are twenty-four buttons, providing one button for each half hour during a twelve hour period. The first button on the left is for the period from 12:30 to 1:00 o'clock, the next for the period from 1:00 to 1:30 o'clock, etc. To program for any particular half hour, slide the button for that period to the channel number desired. For periods when no program is desired, place the button in the "Off" position.

The Time Zone wheel must be set to the AM or FM position in order for the programmer to operate. The selections made with the buttons will occur during a twelve hour period indicated by the "AM-Off-PM" wheel. At the end of a twelve hour period, the receiver will remain on the last channel selected (or Off if this was the last selection), unless the wheel is turned manually to conform to the next period (i.e., from AM to PM or PM to AM). The receiver will remain on the last selection for a period of twelve and one half hours. At that time it will again follow programmed selections.

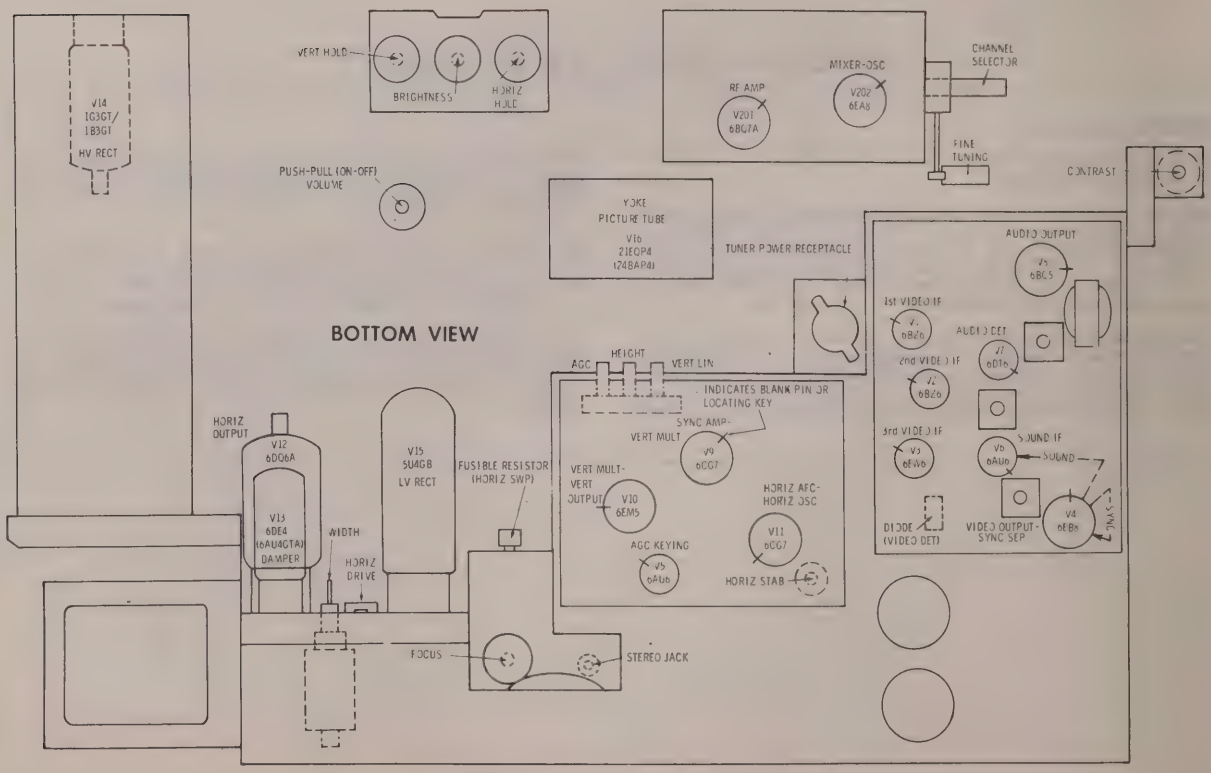
For the time from 3:00AM to 4:00AM the receiver will automatically turn off. If the receiver is to be on during this time, the Manual/Automatic switch must be turned to "Manual". However, after 20 minutes the switch may be turned back to Automatic AM programming.

A disk, white or black appears in the window near the top of the clock face, to indicate whether the clock is programming for the AM or PM period, white for AM, black for PM. When setting the clock make sure to always turn the hands clockwise and that the proper color disk is showing.

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	120K	1300Ω	0Ω	.1Ω	▲ 220Ω	▲ 220Ω	0Ω		
V2	6BZ6	▲ 15K	▲ 33Ω	0Ω	.1Ω	† 220Ω	† 220Ω	90K		
V3	6EW6	.1Ω	125Ω	.1Ω	0Ω	† 3200Ω	† 3200Ω	0Ω		
V4	6EB8	0Ω	4.9meg	† 2.2meg	.1Ω	0Ω	47Ω	4200Ω	† 18K	† 6500Ω
V5	6AU6	† 25K	† 7500Ω	.1Ω	0Ω	520K	† 0Ω	† 7500Ω		
V6	6AU6	47K	0Ω	.1Ω	0Ω	† 6700Ω	† 6700Ω	82Ω		
V7	6DT6	4Ω	560Ω	0Ω	.1Ω	† 560K	† 8200Ω	470K		
V8	6BQ5	0Ω	0Ω	220Ω	0Ω	.1Ω	NC	† 2500Ω	NC	† 2200Ω
V9	6CG7	† 17K	† 560K	0Ω	0Ω	.1Ω	● ǂ 3.2meg	2meg	0Ω	0Ω
V10	6EM5	† 2200Ω	0Ω	● 1.6meg	.1Ω	0Ω	● 1.6meg	0Ω	NC	† 600Ω
V11	6CG7	† 0Ω	● 660K	● 520K	0Ω	.1Ω	† 68K	● 80K	70Ω	0Ω
V12	6DQ6A	TP	0Ω	NC	† 8200Ω	1meg	NC	.1Ω	100Ω	TOP CAP ǂ 15Ω
V13	6DE4	NC	NC	¶ 5.5meg	NC	† 2Ω	NC	.1Ω	0Ω	
V14	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ 465Ω
V15	5U4GB	NC	¶	NC	19Ω	NC	20Ω	NC	¶	
V16	21EQP4	0Ω	22K	ǂ 470K	ǂ 4meg	NC	22K	● 150K	.1Ω	
V201	6BQ7A	† 2300Ω	500K	600K	0Ω	.1Ω	600K	2.3meg	0Ω	0Ω
V202	6EA8	† 820Ω	100K	▲ 1000Ω	0Ω	.1Ω	▲ 1500Ω	0Ω	INF	▲ 5600Ω
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
▲ MEASURED FROM PIN 8 OF V202.
† MEASURED FROM 280V SOURCE.
NC NO CONNECTION.
ǂ MEASURED FROM PIN 3 OF V13.
TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder with CIRCUITRACE*

SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

MODEL 130 (Ch. 528.51620)

SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

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SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

MODEL 130 (Ch. 528.51620)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL 130

1. Remove 9 wood screws and 1 metal screw holding rear cover. Remove antenna leads. Remove rear cover.
2. Remove 6 push-on type knobs from the front.
3. Remove speaker leads, yoke plug, picture tube socket, and HV lead.
4. Remove 2 wood screws holding interlock assembly.
5. Remove 2 chassis nuts at bottom and 3 wood screws at top of chassis.
6. Remove chassis.

NOTE: Picture Tube removal is from the front.

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	Silvertone	MODELS	CHASSIS	MODELS	CHASSIS
		PC-114, PC-116, PC-150, PC-152,		114, 116, 150, 152, 154, 156,	
		PC-154, PC-156, PC-170, PC-172 ..	456.51580	170, 172	528.51580
			456.51582		528.51582
			456.51584		528.51584
		PC-114-5, PC-116-5, PC-150-5,		114-5, 116-5, 150-5, 152-5,	
		PC-152-5, PC-154-5, PC-156-5,		154-5, 156-5, 170-5, 172-5	528.51581
		PC-170-5, PC-172-5	456.51581		528.51583
			456.51583		528.51585
			456.51585	190, 192	528.51600*
		PC-190, PC-192	456.51600*		528.51602*
			456.51602*		528.51604*
			456.51604*	190-5, 192-5	528.51601*
		PC-190-5, PC-192-5	456.51601*		528.51603*
			456.51603*		528.51605*
			456.51605*	130, 132	528.51620
		PC-130, PC-132	456.51620		528.51622
			456.51622		528.51624
			456.51624		528.51626
			456.51626	130-5, 132-5	528.51621
		PC-130-5, PC-132-5	456.51621		528.51623
			456.51623		528.51625
			456.51625		528.51627
			456.51627		

SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Avenue, Chicago, Illinois
TYPE SET	Television Receiver
TUBES	VHF-Fifteen, UHF-Sixteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 150 Watts, 1.45 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

* These units use Amplifier Chassis 528.59530 and Record Changer Chassis 528.56802 or 528.56803.
FOR SERVICE INFORMATION ON THESE CHANGERS SEE PHOTOFACT SET 417 FOLDER 10 FOR SIMILAR UNIT.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 push-on type knobs from the front. Remove 3 wood screws from the bottom of the mask and 1 from each side. Pull mask out at the bottom and remove.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the chassis. (See "Disassembly Instructions".)

AGC

The AGC may be varied by means of a Local-Distance control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 6 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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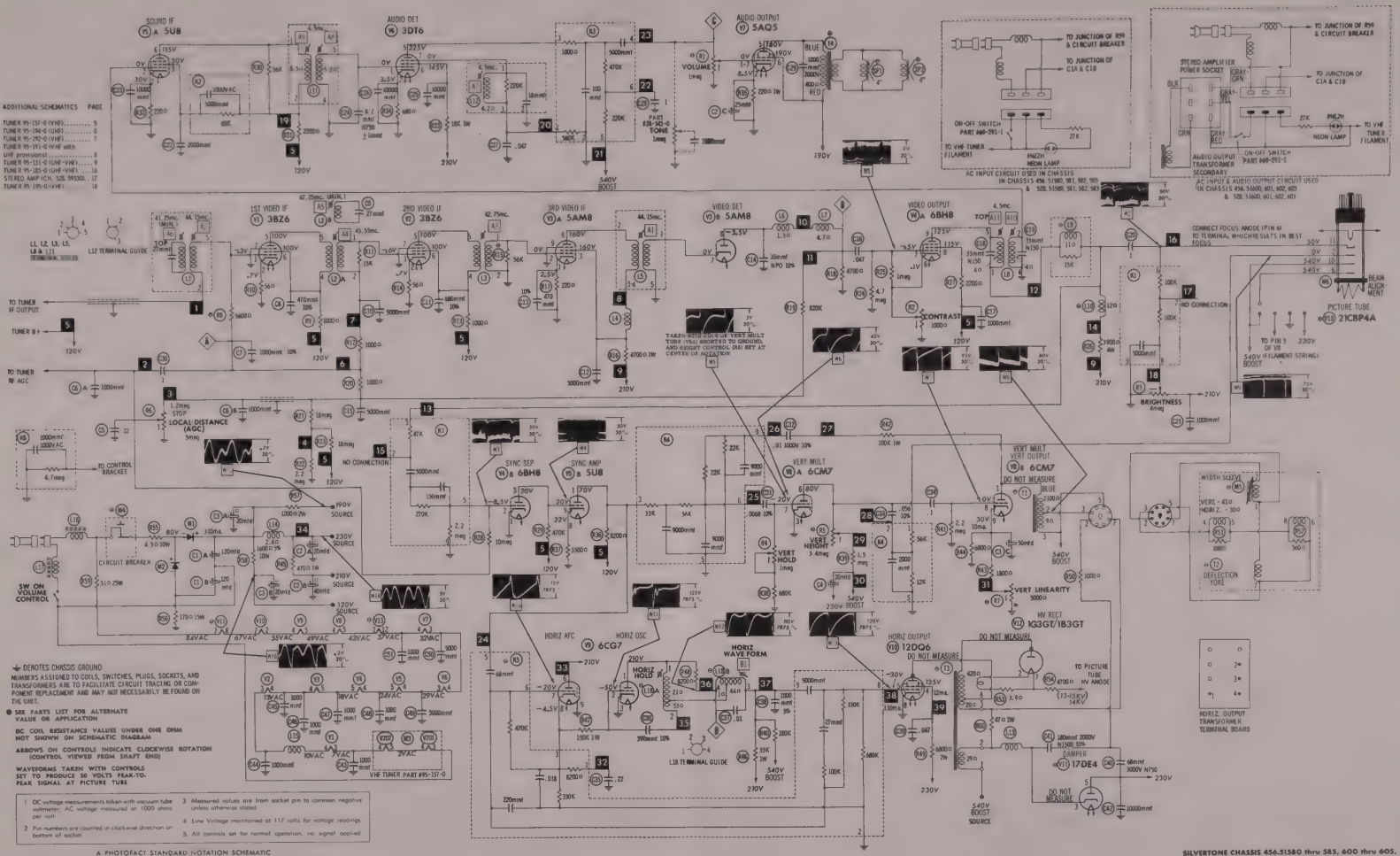
JA565

SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

SET 462 FOLDER 2


SOUND IF V5 A 5U8
AUDIO DET V6 3DT6
AUDIO OUTPUT V7 5AQ5
VOLUME 1meg
TONE 1meg
PART #38-345-0
ADDITIONAL SCHEMATICS PAGE
TUNER 95-157-0 (VHF)..... 5
TUNER 95-194-0 (UHF)..... 6
TUNER 95-192-0 (VHF)..... 7
TUNER 95-191-0 (VHF with UHF provisions)..... 8
TUNER 95-131-0 (UHF-VHF)..... 9
TUNER 95-185-0 (UHF-VHF)..... 16
STEREO AMP (CH. 528.59350)... 17
TUNER 95-195-0 (VHF)..... 18
TO JUNCTION OF R59 & CIRCUIT BREAKER
TO JUNCTION OF C1A & C1B
ON-OFF SWITCH PART #69-291-1
TO VHF TUNER FILAMENT
#NE2H NEON LAMP
AC INPUT CIRCUIT USED IN CHASSIS 456.51580, 581, 582, 585 & 528.51580, 581, 582, 585
STEREO AMPLIFIER POWER SOCKET
AUDIO OUTPUT TRANSFORMER SECONDARY
AC INPUT & AUDIO OUTPUT CIRCUIT USED IN CHASSIS 456.51600, 601, 602, 603 & 528.51600, 601, 602, 603
LST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 A 5AM8
VIDEO DET V3 B 5AM8
VIDEO OUTPUT V4 A 6BH8
LL, L2, L3, L5, L8 & L31 L12 TERMINAL GUIDE
TOP
TO TUNER IF OUTPUT
TUNER B+
TO TUNER RF AGC
TAKEN WITH FOCUS AND VERT MULT TUBE (V8A) SHORTED TO GROUND, AND HEIGHT CONTROL (R6) SET AT CENTER OF ROTATION
CONTRAST
BRIGHTNESS 4meg
CONNECT FOCUS ANODE (PIN 6) TO TERMINAL WHICH RESULTS IN BEST FOCUS
NO CONNECTION
TO PIN 5 OF V8
540V FILAMENT STRING BOOST
BEAM ALIGNMENT
PICTURE TUBE
V13 21CBP4A
LOCAL DISTANCE (AGC) 5meg
TO CONTROL BRACKET
SYNC SEP V5 B 6BH8
SYNC AMP V5 B 5U8
VERT MULT V8 A 6CM7
VERT MULT VERT OUTPUT V8 B 6CM7
DO NOT MEASURE
BLUE
VERT HEIGHT 3.4meg
VERT HOLD 1meg
VERT LINEARITY 5000Ω
HV RECT V12 1G3GT/1B3GT
WIDTH SLEEVE
VERT. - 410
HORIZ. - 300
DEFLECTION YOKE
CIRCUIT BREAKER
SW ON VOLUME CONTROL
230V SOURCE
210V SOURCE
120V SOURCE
190V SOURCE
540V BOOST
540V BOOST SOURCE
HORIZ AFC
HORIZ OSC V9 6CG7
HORIZ HOLD
HORIZ WAVE FORM
HORIZ OUTPUT V10 12DQ6
TO PICTURE TUBE HV ANODE (13-15KV) (4KV)
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
DAMPER V11 17DE4
L18 TERMINAL GUIDE
VHF TUNER PART #95-157-0
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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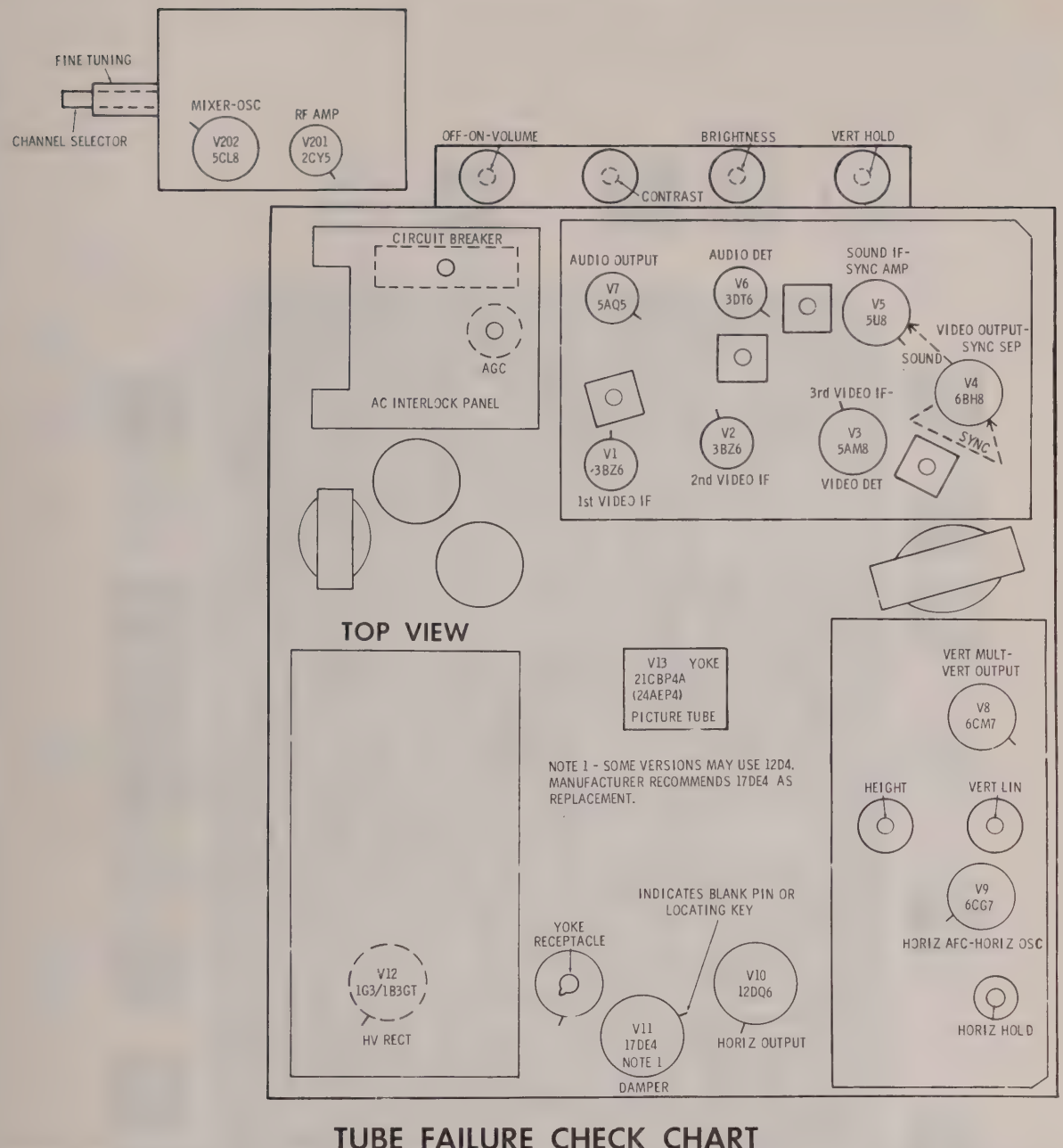
SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

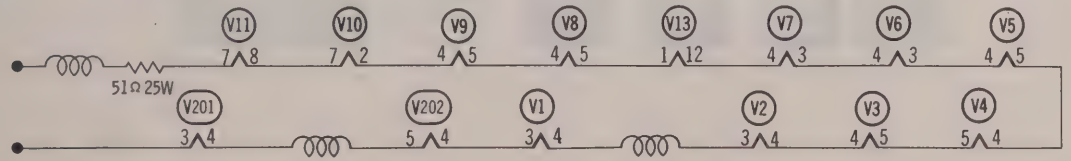
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V13
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, Rectifiers (B+)
Vert. off freq. V8
Horiz. off freq. V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V13
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V4, V5
No horiz. sync V4, V5
No vert. or horiz. sync V4, V5

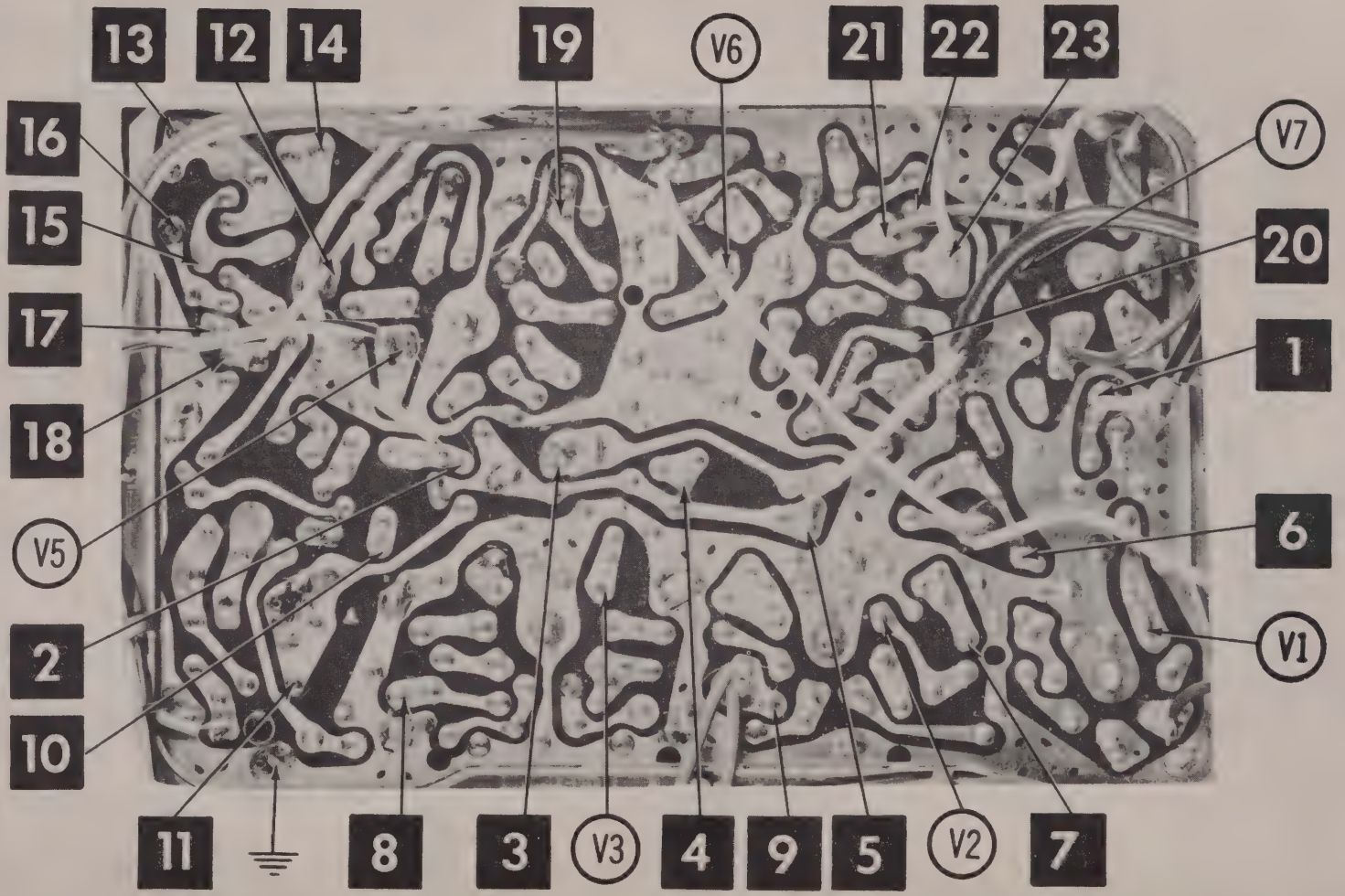
This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

FOLDER 2

CircuiTrace Numbers 1 thru 23



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MAIN PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 95-157-0

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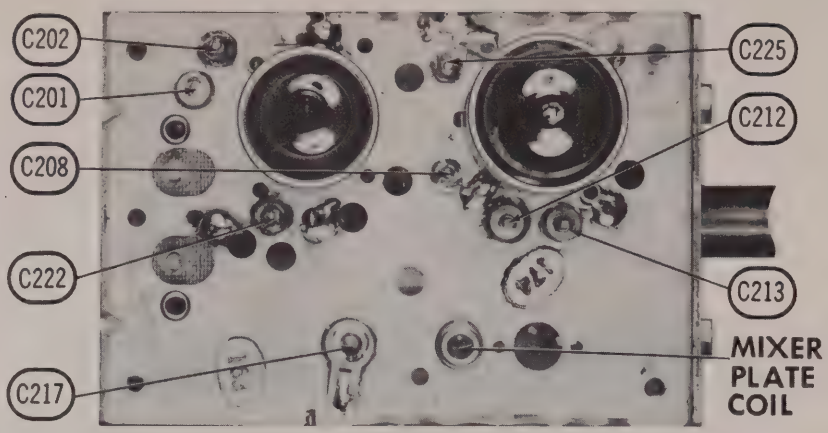
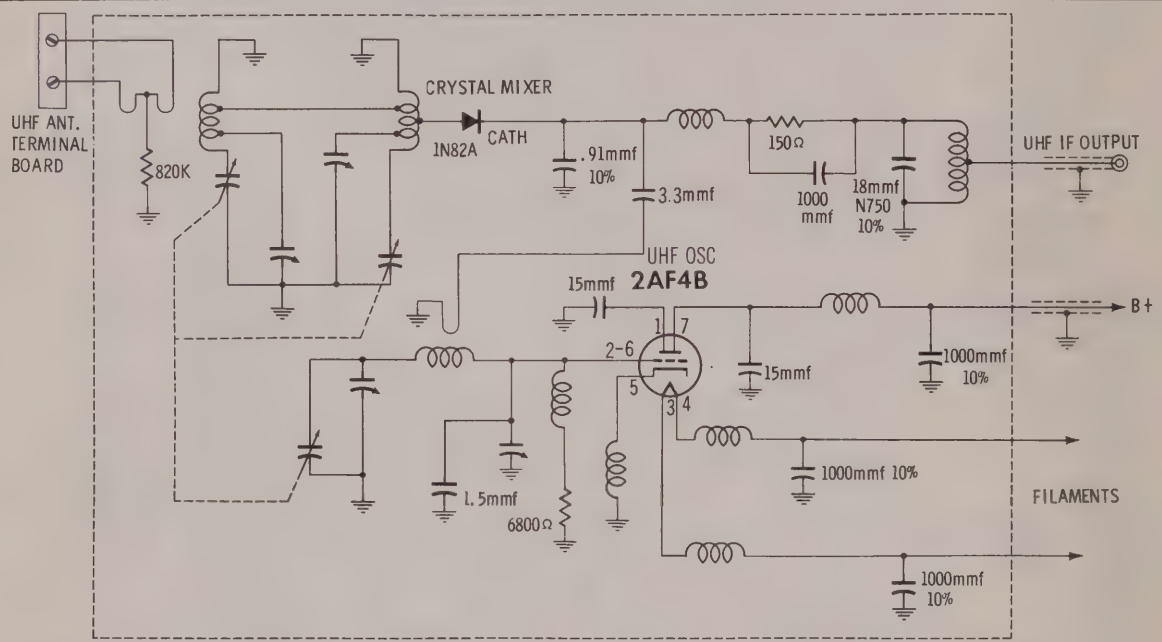


TUNER 95-157-0 TOP VIEW



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UHF TUNER 95-194-0 TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT FOR TUNERS 95-157-0, 95-144-0, 95-187-0, 95-195-0

Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest high band channel (13-7) operating in the area. Adjust the high band oscillator adjustment slug (A201, located at 6 o'clock) for best picture and sound.
Switch Channel Selector to the highest low band channel (6-2) channel operating in the area and adjust the low band oscillator adjustment (A202 located at 2 o'clock) for best picture and sound. Recheck high band adjustment.

VHF RF AND MIXER ALIGNMENT FOR TUNERS 95-157-0, 95-144-0, 95-187-0, 95-195-0

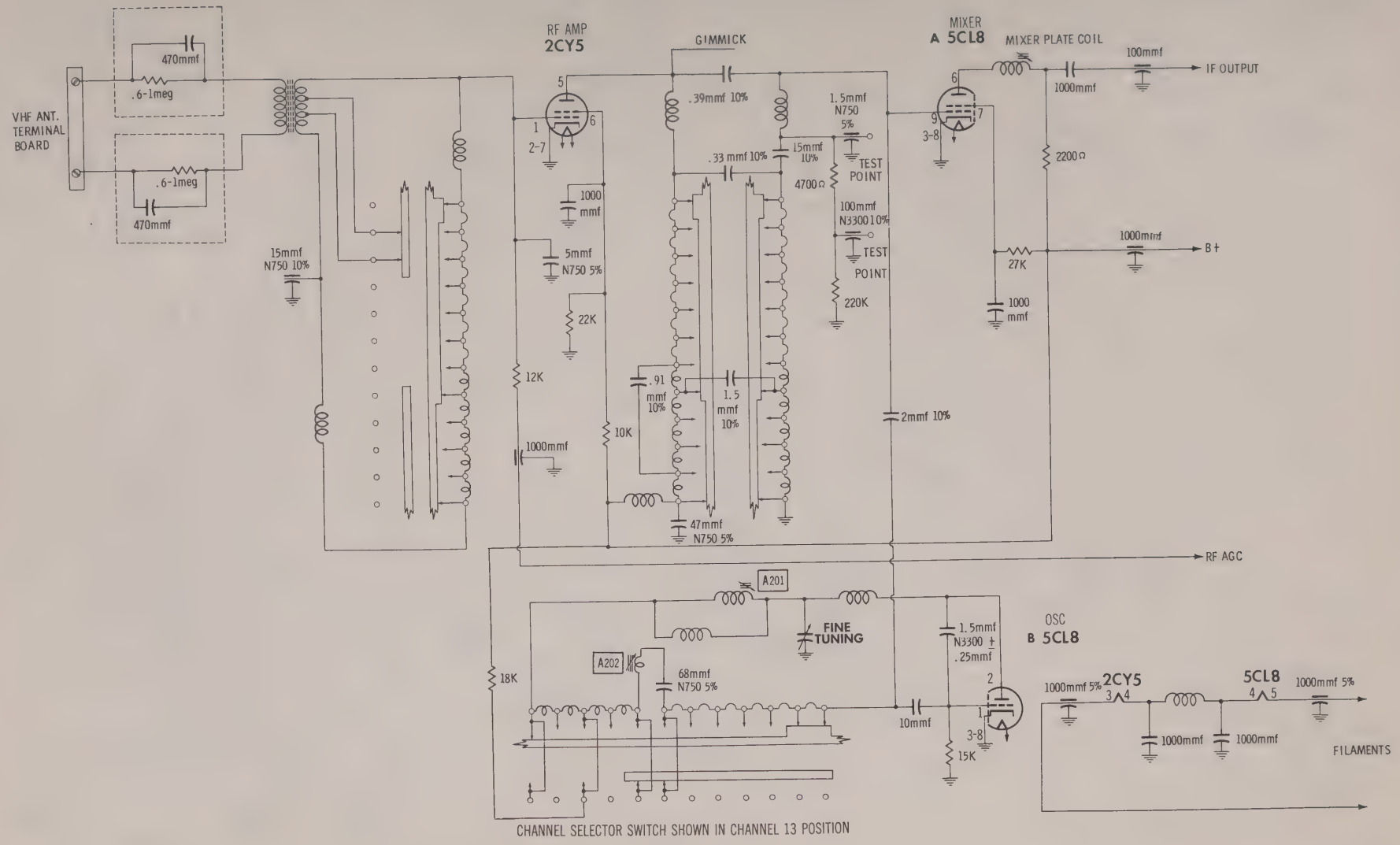
This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

VHF OSCILLATOR ALIGNMENT FOR TUNERS 95-191-0, 95-192-0

Turn the set on and allow 15 minute warm-up period. Set the Fine Tuning to the center of its range.
Turn the Channel Selector to the highest frequency channel operating in the area. With a non-metallic screwdriver, adjust the proper Oscillator adjustment screw for clearest picture. The Oscillator adjustment screws are identified by the channel number stamped into the metal next to the proper adjustment opening. Channels 7 and 8 share the same screw for adjustment, all others have separate adjustments screws.
Be very careful not to turn any of the adjustment screws too far counterclockwise or they will fall out and necessitate the removal of the chassis to replace them.
Always adjust the highest operating channel first, then the others in descending order.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attemped in the field.



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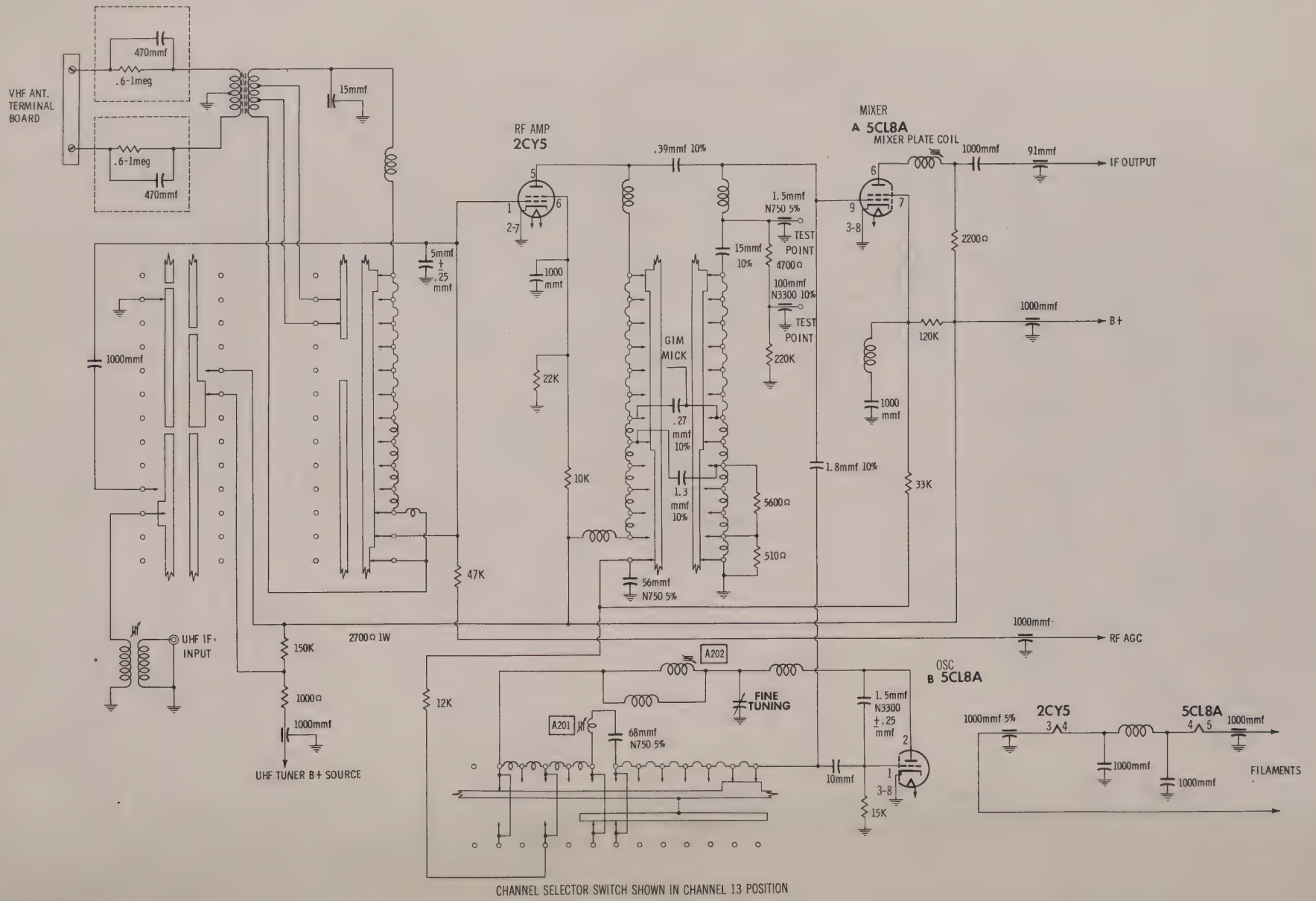
VHF TUNER 95-192-0

SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

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VHF TUNER with UHF provisions 95-191-0

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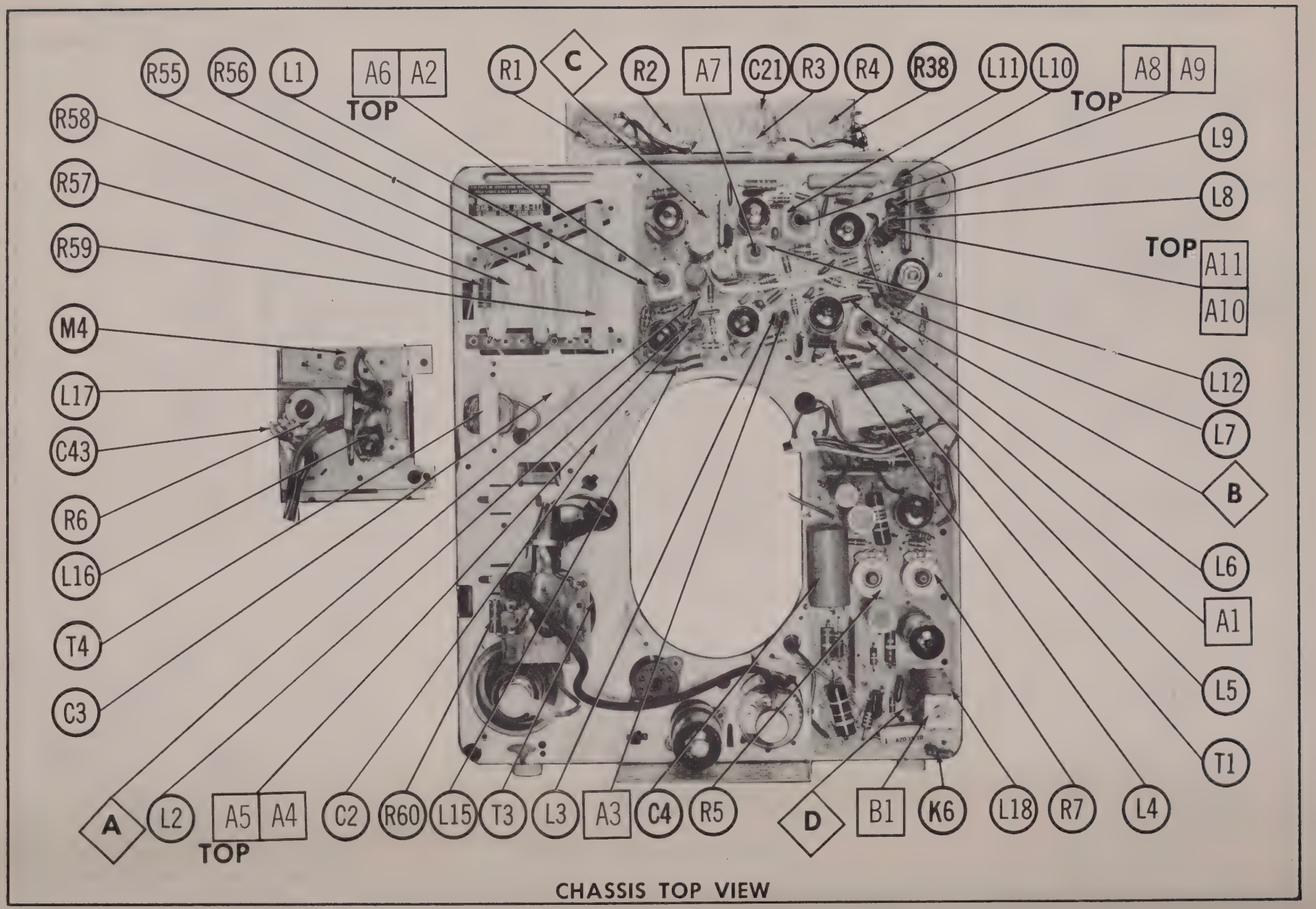


CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Short the antenna terminals together, but not to chassis.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Detune A1, A4, A5, A6, and Mixer Plate Coil by turning the cores almost out of the coil forms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.15MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load)	A1, A2, & Mixer Plate Coil	Attenuate generator output to maintain not more than 2 volts on VTVM. Adjust for maximum deflection.
2.	"	"	42.75MC	"	"	A3	"
3.	"	"	45.55MC	"	"	A4	"
4.	"	"	47.25MC	"	"	A5	Increase generator output. Adjust A5 for MINIMUM deflection. Repeat steps 3 and 4.
5.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Short the antenna terminals together, but not to chassis.
Attenuate sweep generator output to maintain not more than 2 volts peak to peak on scope.
If separate marker generator is used, couple loosely to output cable of sweep generator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.25MC (10MC Swp)	41.25MC 42.55MC 43.8MC 44.15MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch Mixer Plate Coil to place 45.75MC marker at 50%. Retouch A1 for proper tilt.

SOUND IF ALIGNMENT

Connect the negative lead of a 5 volt bias supply to point (A). Positive to chassis.
Set Contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.05mfd	High side to point (B). Low side to chassis. (.1 volt output)	4.5MC (400∿ FM 15KC Swp)	Any non-interfering channel	AC probe to point (C). Common to chassis.	A7, A8	Adjust for maximum deflection. If two peaks are found, use the greater peak.
2.	"	High side to point (B). Low side to chassis. (500 microvolts)	"	"	"	A9, A10	Adjust for maximum deflection. Retouch A8 for maximum deflection.

4.5MC TRAP ALIGNMENT

Tune in a TV signal and adjust the Fine Tuning until a 4.5MC beat interference is noted in the picture. Adjust A11 until the horizontal scanning lines are smooth and continuous.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

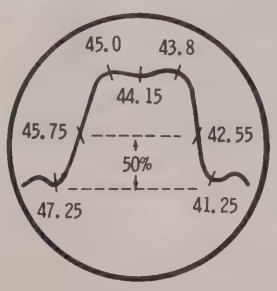


FIG.1

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA	USE	TYPE
V1	1st Video IF Amp	3BZ8				
V2	2nd Video IF Amp	3BZ6				
V3	3rd Video IF Amp - Video Det	5AM8				
V4	Video Output-Sync Sep	6BH8				
V5	Sound IF Amp -Sync Amp	5U8				
V6	Audio Det	3DT8				
V7				5AQ5	Audio Output	
V8				6CM7	Vert. Mult. - Vert. Output	
V9				6CU7	Horiz. AFC-Horiz. Osc.	
V10				12DQ6	Horiz. Output	
V11				17DE4	Damper	Note 1
V12				1GB/ 1B3GT	HV Rect	

Note 1. Some versions may use 13D4. Manufacturer recommends 17DE4 as replacement.

PICTURE TUBE

ITEM No	Silvertone PART No	GENERAL ELECTRIC PART No	RCA PART No	RAYTHEON PART No	SYLVANIA PART No	NOTES
V13	21CBP4A	21CBP4A ①	21CBP4A ①	21CBP4/ 21CBP4A ①	21CBP4. 21CBP4A ②	① Aluminized ② "Silver Screen 85"
	24AEP4	24AEP4 ①	24AEP4	24AEP4 ①	24AEP4 ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP.	RATING VOLT	Silvertone PART No	AEROVOX PART No	CORNELL-DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No	NOTES
C1A	130	150	18-50-5	PRS-050	BR5015	TCS49	TD-150-150	TVAS-2465 *	
B	130	150			BR5015		TD-150-150		
C2A	±20	300	18-53-3	AFH3-110-50	XC0732		TMD-101	TVLS-3564.2 *	
B	±40	300					TD-40-350		
C	35	15							
C3A	±30	300	18-53-3	AFH3-138	B0400	FP366	TMD-29	TVLS-3751.2 *	
B	±20	300			BR505		TD-50-50		
C	50	50							
C4	20	350	18-76-5	PRS7560		TCN3520		TVAS-1608.1 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	.23	100		30-72-1	PSBBN-23		CUB23P2	GEM-2023	TTM-P2	
C6A	1000			15-10218	BPD-2X001	DD8-102	BYCSDD1	B2X310	58K-2D10	
B	1000						BYCSDD1	B2X310	58K-2D10	
C7	1000		10%	30-78-0	DI-1000	DD-102	PM6DI	GP310	10TS-D10	
C8	470		10%	30-66-0	DI-470	DD-471	5R5T47	GP347	10TS-T47	
C9	27				DI-27	DD-270	L20Q27	CNO-427	10TS-Q27	
C10	5000			30-87-0	BPD-005	DD-502	BYA10D5	B-250	58K-D50	
C11	680		10%	30-118-0	DK-680	DD-681	1R5T68	GP368	10TS-T68	
C12	5000			30-87-0	BPD-005	DD-502	BYA10D5	B-250	58K-D50	
C13	470		10%	30-66-0	DI-470	DD-471	GP347	GP347	10TS-T47	
C14	10		KPO 10%	30-14-0	KPO-SI 10	TCZ-10	CI0QSC	CNO-410	10TCC-Q10	
C15	5000			30-87-0	BPD-005	DD-502	BYA10D5	B-250	58K-D50	
C16	.047	400		30-44-1	P41S1N-047		BC5S47J	ACE5147	48E-S47	
C17	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-220	58K-D20	
C18	33		NI50				BYA10D1	B-110	58K-D10	
C19	33		NI50						10TCP-Q33	
C20	.1	400		30-43-1	P41S1N-1	DF-104	BC5P1J	ACE401	48E-P1	
C21	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-220	58K-D20	
C22	2000			30-69-0	BPD-002	DD-202	BYA10D2	B-230	58K-D30	
C23	10000			30-86-0	BPD-01	DD-103	BYA10S1	B-110	58K-S10	
C24	8.2		N750 ±1mmf	30-118-0	N750-DZ 8.2	DTN-8R2	C0V8R2J		8TM-S8	
C25	10000			30-86-0	BPD-01	DD-103	BYA10S1	B-110	58K-S10	
C26	10000			30-86-0	BPD-01	DD-103	BYA10S1	B-110	58K-S10	
C27	.047	400		30-44-1	P41S1N-047		BC5S47J	ACE5147	48E-S47	
C28	1	600		30-124-1	P41S1N-047	DF-104	BC5P1J	ACE501	58E-P10	
C29	1000	3000		30-76-0	HVD-15-1000	DD30-103	HVB3D10	21V-310	30GA-D10	
C30	.1	600		30-81-0	P2S1N-1	DF-104	BC5P1J	ACE601	58E-P10	
C31	0068	600	10%	30-97-1	V84CSD68-10%		PM6SD68	GEM-16268	8TM-D68	
C32	01	1000	10%	30-76-1				GEM-1611	10TM-S1	
C33	.056	600	10%	30-116-1					8TM-S6	
C34	.1	400		30-43-1	P41S1N-1	DF-104	BC5P1J	ACE401	48E-P1	
C35	.22	200		30-43-1	P2S1N-23		BC5P2J1	ACE5022	28E-P22	
C36	390		10%	30-15-2	1468-00039K	D8-391	5R3T39	M5-2349	M5-339	
C37	01	600		30-81-0	P6S8N-01		CU5S1	GEM-611	8TM-S1	
C38	1000		5%	30-9-2	1468-001J		1R5DN		M5-31	
C39	.047	400		30-90-1	P41S1N-047	DF-503	BC5S47J	ACE5147	47M-S47	
C40	68	3000	N750	30-137-0						
C41	180	3000	NI500 10%	15-116316						
C42	10000			15-10317	BPD-01	DD-103	BYA10S1	B-110	58K-S10	
C43	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	
C44	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	
C45	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	
C46	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	
C47	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	
C48	1000			30-66-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	
C49	5000			30-87-0	BPD-005	DD-502	BYA10D5	B-250	58K-D50	
C50	5000			30-87-0	BPD-005	DD-502	BYA10D5	B-250	58K-D50	
C51	1000			30-65-0	BPD-001	DD-102	BYA10D1	B-210	58K-D10	

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	Silvertone PART No.	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	24-351-0	B-70-S	A47-1meg-Z	Q13-137	TA16L	Volume, Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWZ-12	76-1	UB-26	Power Off-On
R2A	1000Ω	½	24-151-1	B-5	A47-1000-B	Q11-108	TA13L	Contrast
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

CONTROLS (cont)

ITEM No	RATING RESIST-ANCE	RATING WATTS	Silvertone PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R3A	4meg	½	24-150-1	B-95	A47-4meg-S	B11-240	TA56L	Brightness
B	Shaft			Not Req	KSS-3	95J	Not Req	
R4A	1meg	½	24-152-1	B-69	A47-1meg S	Q11-137	TA19L	Vert Hold
B	Shaft			Not Req.	KSS-3	Not Req	Not Req.	
R5	3 4meg	½	24-140-1					Vert. Height, Note 2
R6A	5meg	½	24-91-1	AB-87 *	B47-5meg-B*	B11-141 *	PTA56L *	Local-Distance (AGC) †
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R7	5000Ω	½	24-267-1					Vert. Lin., Note 2

* Use 1meg resistor in series with right hand terminal, viewed from shaft end, terminals down.
† 1.2meg stop.
Note 1. Ch. 456/528.51580 thru 585, 600 thru 605 use 1meg control with switch (Part #24-343-0).
Note 2. Some versions may use 3.4meg Height, 5000Ω Linearity dual (Part #24-141-1).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	5600Ω	Note 1
R9	1000Ω	
R10	56Ω	
R11	15K	
R12	1000Ω	
R13	1000Ω	
R14	56Ω	
R15	56K	Note 2
R16	47000 1W	
R17	220Ω	
R18	4700Ω	
R19	820K	
R20	1000Ω	
R21	18meg	
R22	2 2meg	
R23	1 6meg	
R24	4 7meg	
R25	1meg	
R26	3900Ω 4W	#61-9-1
R27	2200Ω	
R28	10meg	
R29	470K	
R30	56K	
R31	2200Ω	
R32	220Ω	
R33	18K 1W	
R34	680Ω	
R35	2200 1W	
R36	8200Ω	
R37	3300Ω	
R38	680K	
R39	1.5meg	
R40	180K	
R41	2.2meg	
R42	100K 1W	
R43	1800Ω	
R44	6800Ω	
R45	4700 1W	
R46	33K 1W	
R47	150K 1W	
R48	8200Ω	
R49	6800Ω 2W	
R50	1000Ω	
R51	560Ω	
R52	560Ω	
R53	5 9Ω	
R54	4700Ω	
R55	4 5Ω 10W	#83-252-3
R56	170Ω 15W	#61-138-0
R57	1200Ω 2W	
R58	16000Ω 5% 10W	
R59	51Ω 25W	#61-118-0
R60	47Ω 1W	

Note 1. Ch. 456/528.51584, 585, 604, 605, 626, 627 use 4700Ω in this application.
Note 2. Ch.456/528.51584, 585, 604, 605, 626, 627 use 10K in this application.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Silvertone PART No	REPLACEMENT DATA
K1	Video & Sync Coupling	150mmf, 5000mmf, 5000mmf. 47K, 100K, 100K, 270K, 2 2meg	13-24-3	
K2	Sound IF Screen	5000mmf ① 1000Ω05, 68K	13-21-3	
K3	Audio Coupling	100mmf, 5000mmf, 10000, 220K, 470K, 560K	13-25-3	
K4	Vert. Integrator	2000mmf, 8000mmf, 8000mmf, 9000mmf, 15K, 22K, 33K, 33K, 56K, 56K	13-23-3	Sprague V-24
K5	Horiz. AFC Cathode	27mmf, 56mmf, 220mmf, 5000 mmf, 18000mmf, 8200Ω, 100K, 330K, 330K, 470K, 680K	13-22-3 ①	Sprague VF-4
K6	Control Panel Isolation	1000mmf ② 1000VAC, 4.7meg	13-17-3	

① Alternate Part #13-25-5 or 13-23-5.

COILS (RF-IF)

ITEM No.	USE	Silvertone PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	NOTES
L1A	1st Video IF	10-25-3						
B	41.25MC Trap							
L2A	2nd Video IF	10-21-3						
B	47.25MC Trap							
L3	3rd Video IF	10-23-3						
L4	RF Choke	10-151-1						
L5	4th Video IF	10-24-3						
L6	Resonant Choke	10-56-1						33uh
L7	Series Peaking Coil	10-64-1			TV-193	6110		60uh
L8A	Sound Take-off	10-152-1						
B	4.5MC Trap							
L9	Series Peaking Coil	10-66-1	19-3250 *	19-3250 *	TV-196 *	6130 *	VP-6 *	270uh ①
L10	Shunt Peaking Coil	10-85-1	19-3250	19-3250	TV-196	6130	VP-6	270uh ②
L11	2nd Sound IF	10-23-3						
L12	Quadrature Coil	10-17-5						
L13	RF Choke	10-135-1	19-1001	19-1001	SW-830	4606		2.5uh
L14	RF Choke	10-136-1	19-3250	19-3250	TV-196	6130	VP-6	270uh
L15	Fil. Choke	10-123-1	19-1003	19-1003	BC-563	4606		2.3uh
L16	Line Choke	10-149-1	19-3036	19-3036	TV-180	6176	VP-1	40uh
L17	Line Choke	10-149-1	19-3036	19-3036	TV-180	6176	VP-1	40uh

* Parallel with 15K resistor. ① Wound on 15K resistor. Alt. Part #10-150-1. ② Alt. Part #10-147-1.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	DC RES. SEC.	Silvertone PART No.	Halldorson PART No.	Merit PART No	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L18A	74Ω		10-21-5 ①						Horiz. Osc. tapped ② 21Ω
B		45Ω							Horiz. Waveform tapped ② 1Ω

① Ch. 456/528.51583 thru 585, 600 thru 605, 623 thru 627 use Part #10-26-5 in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	Silvertone PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	860-1-2G		A-2824	V315		VO-101 ②		A-138X
	Alt. Vert. Output	80-1-2		A-3824	V315		VO-101 ③		A-138X
T2	Yoke-Horiz (30MH) (90°)-Vert. (40MH)	D80-5-4F ②	Y-16 ④ ⑤	MDF-92 ④ ⑤	Y90F19/43 ④ ⑤	PCM2045 ④ ⑤	DY-16A ④ ⑤	Y-16 ④ ⑤	Y-41 ⑤ NW-1 ⑤
	Alt. Yoke	80-5-4 ②	Y-16 ④ ⑤	MDF-92 ④ ⑤	Y90F19/43 ④ ⑤	PCM2045 ④ ⑤	DY-16A ④ ⑤	Y-16 ④ ⑤	Y-41 ⑤ NW-1 ⑤
	Rear Cover & Centering Device	63-936							YC-1 ⑥ CL-1
	Alt Rear Cover & Centering Device	63-1034							YC-1 ⑥ CL-1
	Yoke Clamp	22-2-3							
	Alt Yoke Clamp	23-115-3							
T3	Horiz Output	80-1-3Q		RVO-166 *					D-161
	Alt. Horiz. Output	80-1-3		RVO-166 *					

① Cut and tape blanking lead.
② Drill new mounting hole(s).
③ Includes yoke plug.
④ Use original yoke damping network if necessary.
⑤ Use original rear cover, centering device, and yoke clamp. Connect yoke terminal #3 to yoke plug pin #7, yoke terminals #2 of #7 to yoke plug #2, yoke #1 to plug #6, jumper from yoke #1 to yoke #6. Connect yoke terminal #4 to plug #3.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	4						
3	3						
2	2						
1	1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Silvertone PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	5200Ω	3-4Ω	80-63-1 ①	24848	A-3025	AU-601	A-3877	24848	S-8X	
	8000Ω	3-4Ω	80-81-1 ②	24851	A-2930	AU-601	A-3877	24851	S-3X	

① Ch. 456/528.51580 thru 627. ② Ch. 456/528.51580 thru 585, 600 thru 605.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V C IMP.	Silvertone PART No.	QUAM PART No.	NOTES
SP1	4"	PM	6-8Ω	33-318-4 ①	4A0T2T.4	① Models 130, 132, 150-5, 152-5
SP2	4"	PM	6-8Ω	33-318-4 ①	4A0T2T.4	② Models 190, 190-5, 192, 192-5
	6"	PM	3-4Ω	33-400-4 ②	6A1S	③ Models 114, 114-5, 116, 116-5
	5"	PM	3Ω	33-328-4 ③		④ Models 170, 170-5, 172, 172-5, 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5
	5"	PM	6-8Ω	33-301-4 ④	5A0T2T.5	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	Silvertone PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.310A	86-8-3 ①	1241AH ①	T350 ①	350A ①	SR500 ③	① Selenium Type.
M2	.310A	86-9-3 ①	1241AH ①	T350 ①	350A ①	SR500 ③	② Silicon Type.

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M3	Tuner	95-157-0	VHF Ch. 454/528.51620
	Tuner	95-158-0	VHF Ch. 456/528.51623, 624, 625
	Tuner	95-122-0	VHF Ch. 456/528.51580, 582, 584, 600, 602, 604
	Tuner	95-121-0	VHF with UHF provisions Ch. 456/528.51581, 583, 585, 601, 603, 605
	Tuner	95-121-0	UHF-VHF. Includes VHF Tuner with UHF provisions 95-144-0 & UHF 95-143-0 Ch. 456/528.51621
	Tuner	95-158-0	UHF-VHF. Includes VHF Tuner with UHF provisions 95-157-0 & UHF 95-156-0 Ch. 456/528.51623, 625, 627
	Tuner	95-194-0	UHF Ch. 456/528.51581, 583, 585, 601, 603, 605
M4	Circuit Breaker	43-3-2	Ch. 456/528.51580, 582, 600, 601, 623 thru 625
	Circuit Breaker	43-4-2	
	Circuit Breaker	43-3-3	Ch. 456/528.51583 thru 585, 603 thru 605, 624 thru 627
	Circuit Breaker	43-1-2	
M5	Width Sleeve	83-1304	Models 130, 132, 150-5, 152-5, 190, 190-5, 192, 192-5
	Width Sleeve	83-1340	Models 114, 114-5, 116, 116-5, 170, 170-5, 172, 172-5, 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5
	Magnet	27-98-2	Beam Alignment used with some tubes
	Printed Board	84-7374	IF, Sync, Sound, Less Tubes
	Printed Board	84-7376-1	H, Sync, Sound, Less tubes Ch. 456/528.51584, 585, 604, 605, 626, 627
	Printed Board	84-7938	Vert., Horiz., Oscillator, Less tubes
	Switch	6w-291-0	Off-On Ch. 456/528.51580 thru 585, 600 thru 605

SILVERTONE CHASSIS 456.456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS

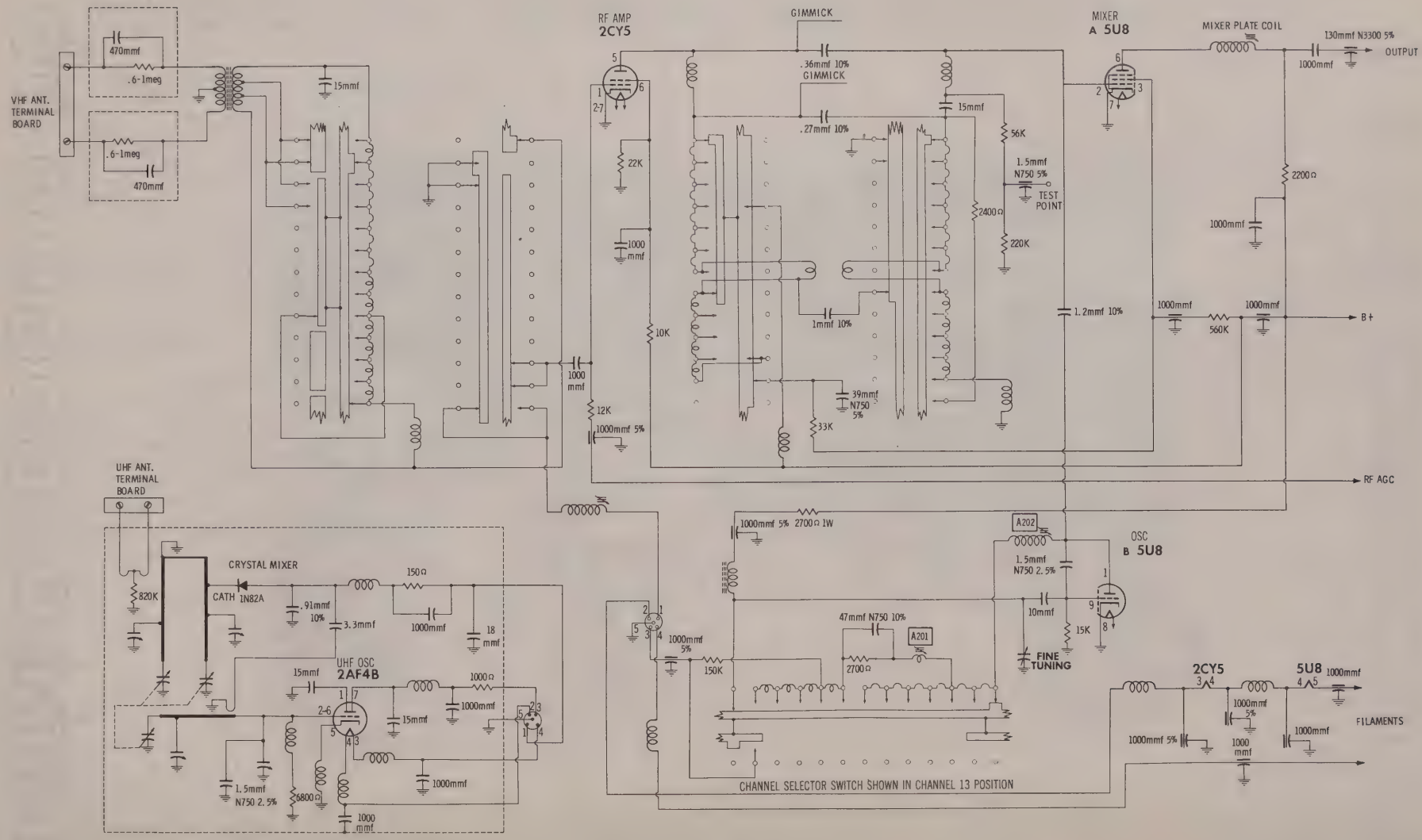
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Bezel	40-38-5	Models 130, 132
Bezel	40-31-5	Models 152, 152-5, 154, 154-5, 156, 156-5, 190, 190-5, 192, 192-5, 114, 114-5, 116, 116-5
Bezel	40-33-5	Models 150, 150-5
Bezel	40-34-5	Models 170, 170-5
Bezel	40-32-5	Models 172, 172-5
Safety Glass	48-148-0	Models 130, 132, 130-5, 132-5
Safety Glass	48-150-0	Models 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5, 190, 190-5, 192, 192-5, 114, 114-5, 116, 116-5
Safety Glass	48-151-0	Models 170, 170-5, 172, 172-5
Knob	52-1224-0	VHF Channel Selector, Models 130, 132
Knob	52-1208	VHF Channel Selector, Models 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5, 190, 190-5, 192, 192-5, 114, 114-5, 116, 116-5
Knob	52-1225-0	UHF Channel Selector, Models 130-5, 132-5
Knob	52-1223-0	VHF Fine Tuning, Models 130-5, 132-5
Knob	52-926-0	VHF Fine Tuning, Models 114-5, 116-5, 190-5, 192-5
Knob	52-1222-0	Fine Tuning, Models 130, 132
Knob	52-1188-0	Fine Tuning, Models 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5, 170, 170-5, 172, 172-5, 190, 192, 114, 114-5, 116, 116-5
Knob	52-1221-0	UHF Fine Tuning, Models 130-5, 132-5
Knob	52-926-0	UHF Fine Tuning, Models 150-5, 152-5, 154-5, 156-5, 170-5, 172-5
Knob	52-1220-0	Dial Indicator, Models 130, 132, 130-5, 132-5
Knob	52-924-0	Dial Indicator, Models 150-5, 152-5, 154-5, 156-5, 170-5, 172-5, 190-5, 192-5, 114-5, 116-5
Knob	52-1219-0	Off-On-Volume, Brightness, Contrast, Vert. Hold, Models 130, 132, 130-5, 132-5
Knob	52-1187-0	Controls (5 used), Models 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5, 170, 170-5, 172, 172-5, 190, 190-5, 192, 192-5, 114, 114-5, 116, 116-5
Knob	52-1281-0	Off-On, Models 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5, 170, 170-5, 172, 172-5, 190, 190-5, 192, 192-5, 114, 114-5, 116, 116-5
Knob	52-1144-0	Tone, Models 190, 190-5, 192, 192-5
Knob	52-1143-0	Right Channel, Models 190, 190-5, 192, 192-5
Knob	52-1109-0	Left Channel, Models 190, 190-5, 192, 192-5
Knob	52-1192-0	TV-Phono, Models 190, 190-5, 192, 192-5
Escutcheon	40-194-0	Control Panel, Models 130, 132-5, 130-5, 132
Escutcheon	40-189-0	Models 150, 150-5, 152, 152-5, 154, 154-5, 156, 156-5
Escutcheon	40-190-0	Models 170, 170-5, 172, 172-5
Escutcheon	40-188-0	Models 114, 114-5, 116, 116-5
Escutcheon	40-191-0	Models 190, 190-5, 192, 192-5
Cabinet	42-136-0	Models 130, 130-5
Cabinet	42-137-0	Models 132, 132-5
Cabinet	42-133-0	Models 150, 150-5
Cabinet	42-134-0	Models 152, 152-5
Cabinet	42-135-0	Models 154, 154-5
Cabinet	42-139-0	Models 156, 156-5
Cabinet	42-142-0	Models 170, 170-5
Cabinet	42-143-0	Models 172, 172-5
Cabinet	42-131-0	Models 114, 114-5
Cabinet	42-132-0	Models 116, 116-5
Cabinet	42-144-0	Models 190, 190-5
Cabinet	42-145-0	Models 192, 192-5
Cabinet	42-30-4	Speaker Enclosure, Models 190, 190-5
Cabinet	42-31-4	Speaker Enclosure, Models 192, 192-5
Leg	49-481	Models 130, 130-5
Leg	49-482	Models 132, 132-5
Leg	49-521	Models 150, 150-5
Leg	49-522	Models 152, 152-5
Leg	49-523	Models 154, 154-5
Leg	49-485	Models 156, 156-5
Leg	49-487	Models 170, 170-5
Leg	49-488	Models 172, 172-5
Leg	49-489	Models 190, 190-5
Leg	49-490	Models 192, 192-5

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

MAIN PRINTED BOARD



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF-VHF TUNER 95-185-0

STEREO AMP CH. 528.59530

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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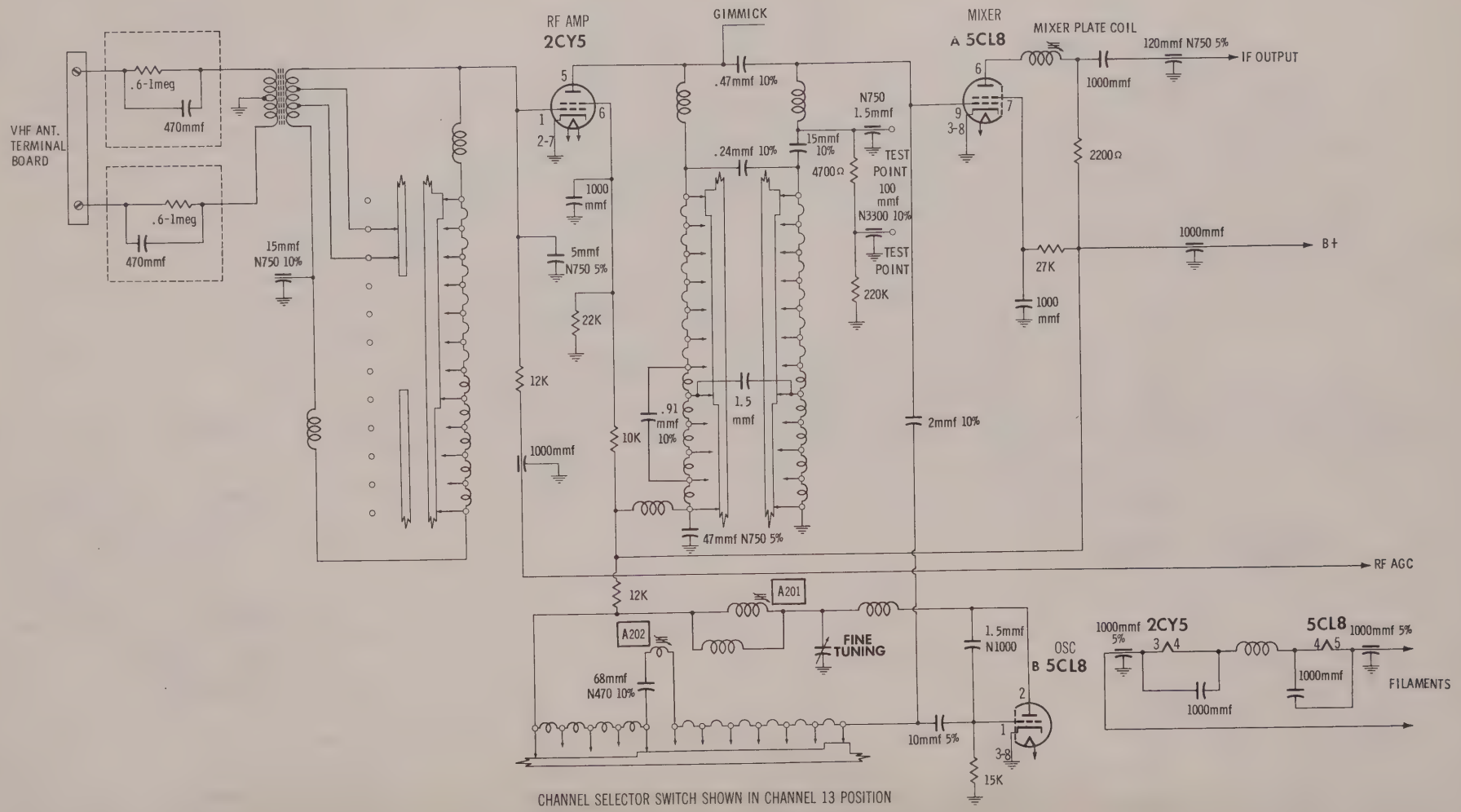

CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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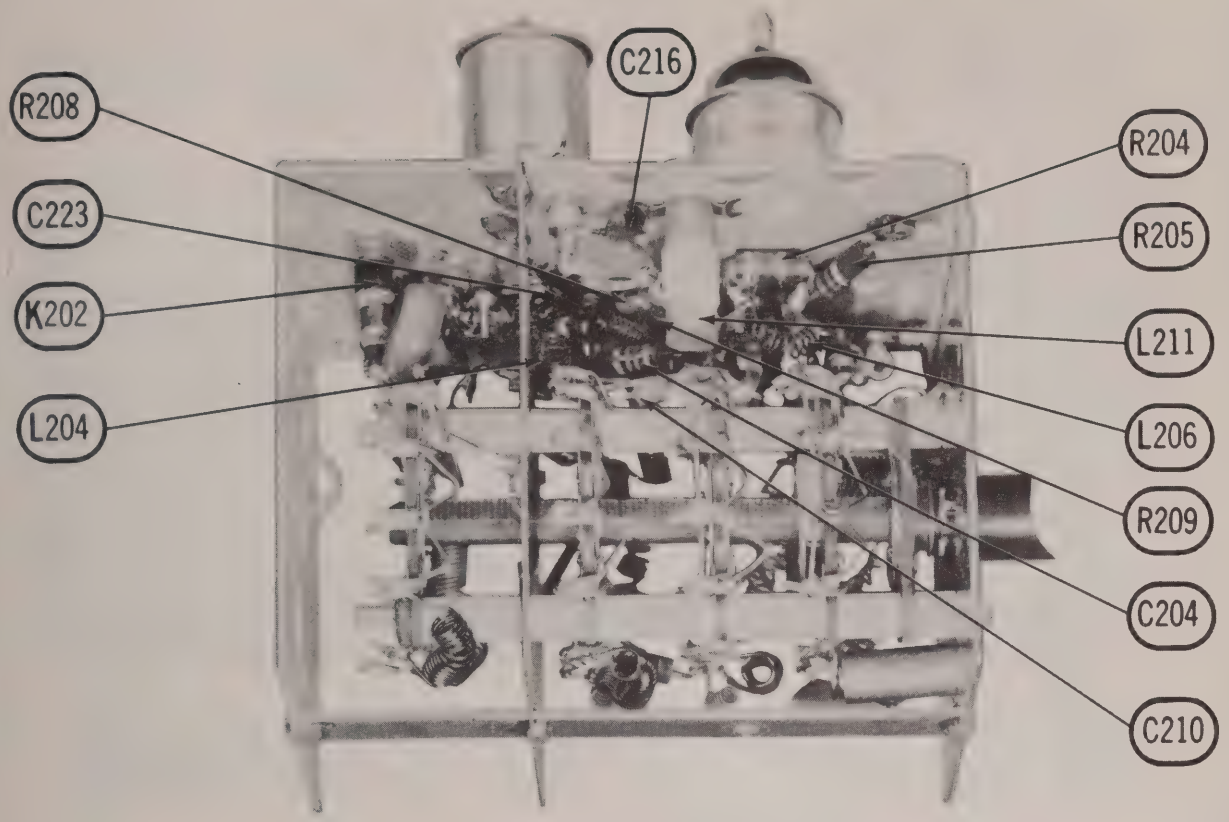
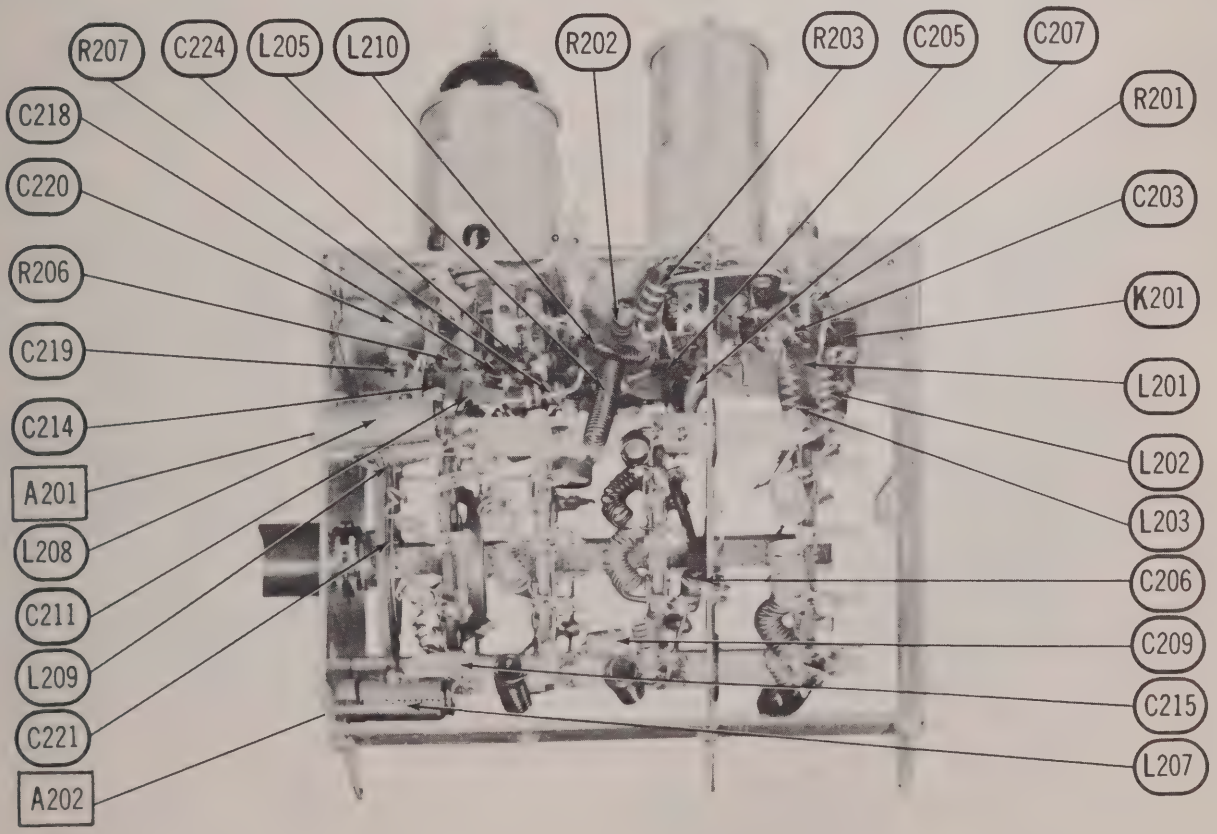
VHF TUNER 95-195-0



TUNER 95-157-0 - LEFT SIDE



TUNER 95-157-0 - RIGHT SIDE

TUNER PARTS LIST AND DESCRIPTIONS

95-157-0

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	2CY5
V202	Mixer-Osc.	5CL8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	15		N750 10%	258-150						
C202	1000		5%	244-1						
C203	5		N750 5%	225-509		DTN-5	C10V5C	CN7-547	10TCU-V5	
C204	.47		10%	2101-478						
C205	1000			2033-23	BPD-001	DD-102	BYA10D1	B-210	5HK-D10	
C206	.91		10%	2101-918						
C207	47		N750 5%	233-470		DTN-47	C10Q47U	CN7-447	10TCU-Q47	
C208	1000			271-1	EF-001	MFT-1000				
C209	1.5		10%	2101-159	NPO-SI 1.5	TCZ-1R5	C10V15C	CNO-515	10TCC-V15	
C210	.24		10%	2101-248						
C211	15		10%	222-150	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	10TCC-Q15	
C212	1.5		N750	259-159						
C213	100		N3300 10%	252-101						
C214	2		10%	2101-209	NPO-SI 2	TCZ-2R2	C10V2C	CNO-522	10TCC-V22	
C215	68		N470 10%	236-680						
C216	1000			2033-23	BPD-001	DD-102	BYA10D1	B-210	5HK-D10	
C217	120		N750 5%	262-121						
C218	1000			2033-23	BPD-001	DD-102	BYA10D1	B-210	5HK-D10	
C219	10		5%	174-100	NPO-SI 10	TCZ-10	C10Q1C	CNO-410	10TCC-Q10	
C220	1.5		N1000	166-159						
C221				2798-503						
C222	1000		5%	244-1	EF-001	MFT-1000				
C223	1000			2033-23	BPD-001	DD-102	BYA10D1	B-210	5HK-D10	
C224	1000			2033-23	BPD-001	DD-102	BYA10D1	B-210	5HK-D10	
C225	1000		5%	244-1	EF-001	MFT-1000				

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	12K	
R202	10K	
R203	22K	

ITEM No.	RATING	REMARKS
R204	4700Ω	
R205	220K	
R206	15K	

ITEM No.	RATING	REMARKS
R207	12K	
R208	2200Ω	
R209	27K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K201	Antenna Filter	470mmf, .6-1meg	330-1	Centralab RC-471 Sprague AC1-1
K202	Antenna Filter	470mmf, .6-1meg	330-1	Centralab RC-471 Sprague AC1-1

COILS (RF-IF)

ITEM No.	USE	SILVERTONE PART No.	NOTES
L201	Ant. Trans.	2309-5	
L202	RF Choke	310-5	
L203	RF Choke	310-5	
L204	RF Choke	363-7	
L205	RF Choke	301-25	
L206	RF Choke	362-7	

ITEM No.	USE	SILVERTONE PART No.	NOTES
L207	Osc. Coil	5381-14	Channel 6, Adj.
L208	Osc. Coil	5381-33	Channel 13, Adj.
L209	Osc. Coil	310-6	Channel 13
L210	Fil. Choke	350-20	
L211	Mixer Plate Coil	2110-9	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
	Selector Shaft Assembly	2767-505	
	Fine Tuning Shaft	2366-505	
	Insulating Collar	2136-1	For Shaft
	Wafer	2800-502	Antenna
	Wafer	2801-508	RF
	Wafer	2802-501	Mixer
	Wafer	2803-507	Osc.

SILVERTONE CHASSIS 456.51580 thru 585, 600 thru 605, 620 thru 627, 528.51580 thru 585, 600 thru 605, 621 thru 627, 528.59350

SWEEP PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

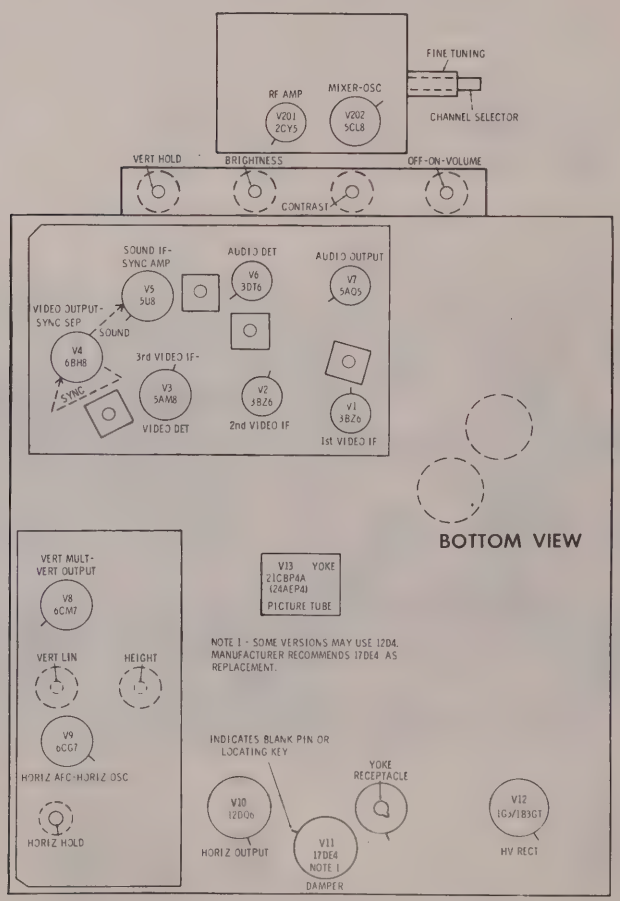
A Howard W. Sams CIRCUITRACE® Photo

FOLDER 2

RESISTANCE MEASUREMENTS

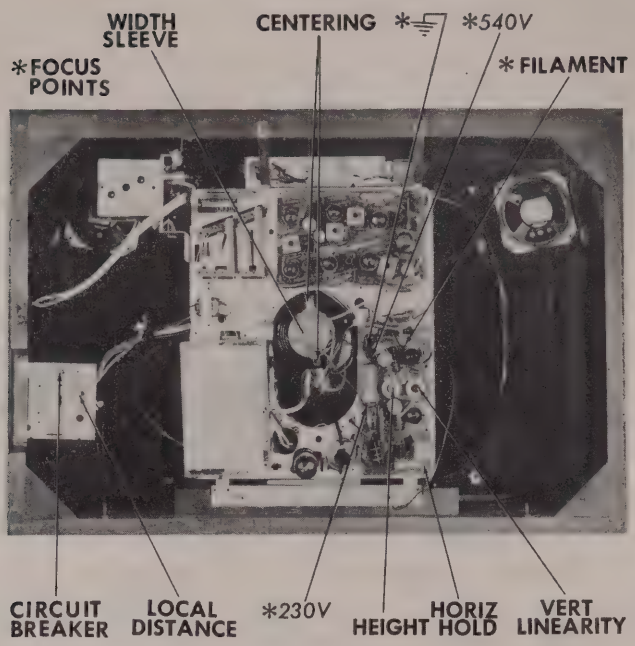
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	750K	56Ω	2Ω	3Ω	†2600Ω	†2600Ω	0Ω		
V2	3BZ6	750K	56Ω	3Ω	4Ω	†2600Ω	†2600Ω	0Ω		
V3	5AM8	220Ω	.1Ω	†5200Ω	4Ω	5.5Ω	†5200Ω	.1Ω	4700Ω	0Ω
V4	6BH8	0Ω	2meg	†470K	7Ω	5.5Ω	●50Ω	1meg	†3800Ω	†4400Ω
V5	5U8	†9800Ω	4Ω	†70K	7Ω	8Ω	†3800Ω	220Ω	3300Ω	†470K
V6	3DT6	5.2Ω	680Ω	8Ω	9Ω	‡690K	†18K	560K		
V7	5AQ5	0Ω	220Ω	9Ω	10Ω	†1600Ω	†1200Ω	0Ω		
V8	6CM7	‡2100Ω	NC	0Ω	13Ω	11.5Ω	●‡3.2meg	●1meg	2.2meg	●2400Ω
V9	6CG7	†30K	450K	0Ω	14.5Ω	13Ω	†470Ω	480K	280K	NC
V10	12DQ6	NC	14.5Ω	NC	†6800Ω	450K	NC	17Ω	0Ω	TOP CAP ‡70Ω
V11	17DE4	TP	NC	¶250K	NC	†2.5Ω	TP	19Ω	17Ω	
V12	1B3GT 1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡480Ω
V13	21CBP4A	11.5Ω	68K	Pin 6 ‡30Ω	Pin 10 ‡30Ω	Pin 11 ● 500K	Pin 12 10Ω			
V201	2CY5	●800K	0Ω	0Ω	.5Ω	†1600Ω	†11K	0Ω		
V202	5CL8	15K	†13K	0Ω	2Ω	.5Ω	†3800Ω	†28K	0Ω	225K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 230V SOURCE.
‡ MEASURED FROM PIN 3 OF V11.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

CABINET—REAR VIEW



HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV station and adjust the Horizontal Hold until picture synchronizes horizontally. If the picture cannot be synced with the Horizontal Hold, turn the Waveform slug (B1) several turns out of the coil form from its original position. Readjust the Horizontal Hold until the picture synchronizes horizontally.

Connect the vertical amplifier of a scope thru a low capacity probe to point ⓓ. Connect low side to chassis. Retouch the Horizontal Hold to synchronize the picture.

Adjust the Waveform slug (B1) for a waveform similar to Fig. 2 with the sharp peak approximately 10% higher than the broad peak. Keep the picture in sync during this adjustment with the Horizontal Hold. Remove scope connection and retouch the Horizontal Hold if necessary to synchronize picture horizontally.

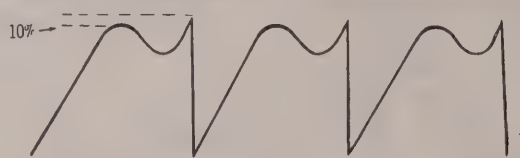
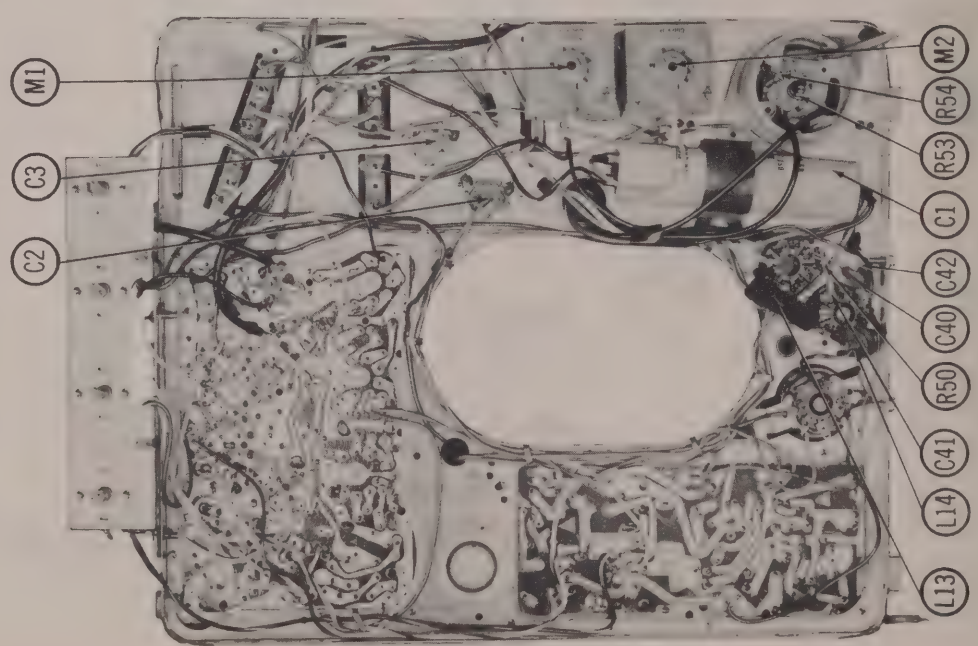


FIG. 2



CHASSIS BOTTOM VIEW

PHOTOFACT* Folder

**PRODUCTION CHANGE
BULLETIN 228**

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 416

General Electric Models 17T2405, 17T2410, 17T2411, 17T2412, 21C2440, 21C2441, 21C2445, 21C2446, 21T2419, 21T2420, 21T2421, 21T2425, 21T2426 & UHF (M4 Line) were covered in PHOTOFACT Folder 2 - Set 416.

Late in production new models and late production changes were added.

The following is a complete list of all new models.

MODEL	MODEL	MODEL	MODEL
17T2406	17T2433	21C2460	21T2417
17T2407	21C2442	21C2461	21T2418
17T2408	21C2443	21C2465	21T2422
17T2415	21C2444	21C2470	21T2424
17T2430	21C2447	21C2471	21T2427
17T2431	21C2448	21C2478	21T2429
17T2432	21C2449	21C2479	

TO IMPROVE AGC

R43 is decreased from 12meg to 11meg.

R42 is decreased from 180K to 150K.

R49 is decreased from 1.8meg to 1.5meg.

R25 is decreased from 180K to 150K.

R24 is decreased from 68K to 56K.

K3 is changed from 470mmf, 150K to 470mmf, 470K.

TO IMPROVE AUDIO NEGATIVE FEEDBACK

R39 is decreased from 120Ω to 100Ω.

TO IMPROVE VERTICAL BLANKING

C46 is decreased from .018 @ 1KV to .015 @ 1KV.

GENERAL ELECTRIC MODELS 17T2406, 17T2407, 17T2408, 17T2415, 17T2430, 17T2431, 17T2432, 17T2433, 21C2442, 21C2443, 21C2444, 21C2447, 21C2448, 21C2449, 21C2460, 21C2461, 21C2465, 21C2470, 21C2471, 21C2478, 21C2479, 21T2417, 21T2418, 21T2422, 21T2424, 21T2427, 21T2429

(Continued on Reverse Side)

PRODUCTION CHANGE
BULLETIN 228

PRODUCTION CHANGE
BULLETIN 228

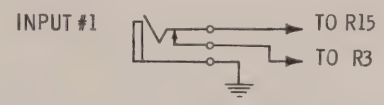
xxxxxx CORRECTION NOTICE xxxxxx

Ferrograph Model 3A/N was covered in PHOTOFACT Folder 5 - Set 438.

The following corrections should be noted on page 14 of the schematic.

Input #1 should be labeled Input #2. Input #2 should be labeled Input #1.

A corrected drawing of Input #1 is given below in this bulletin.



FERROGRAPH MODEL 3A/N

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 462 FOLDER 3

TO IMPROVE VIDEO RESPONSE

L5B (47.25MC Trap) was removed from the plate circuit of V2 (6AU6A). With this change L5 part number is changed to WT61X98.

R19 is omitted.

R7 is omitted.

C33 is omitted.

R23 is increased from 3900Ω to 4700Ω.

R22 is increased from 5600Ω to 15K.

L12 (Part #WT36X3731) is changed to WT36X366.

COMPONENT CHANGE

Deflection yoke (T3) is changed from Part #WT76X27 to WT76X28.

C24 (Video Output Cathode Bypass) was omitted in late production.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 427

Admiral Chassis 18A6C, CB,T, TB, 18B6C, CB, T, TB, 18UA6C, CB, T, TB, 18UB6C, CB, T, TB, 8R1 werecovered in PHOTOFACT Folder 1 - Set 427.

Late in production new models and late production changes were added.

Following is a complete list of all models and the chassis used.

MODEL	CHASSIS	MODEL	CHASSIS
C21G2B	18A6CB	C21UG44B	18UB6CB
C21G3B	18A6CB	CS21G52	18D6T
C21G12B	18B6CB	CS21G53	18D6T
C21G13B	18B6CB	L21G12B	18B6CB
C21G14B	18B6CB	L21G13B	18B6CB
C21G22B	18B6CB	L21G14B	18B6CB
C21G23B	18B6CB	L21G32B	18B6CB
C21G24B	18B6CB	L21G37B	18B6CB
C21G32B	18B6CB	L21UG12B	18UB6CB
C21G33B	18B6CB	L21UG13B	18UB6CB
C21G34B	18B6CB	L21UG14B	18UB6CB
C21G42B	18B6CB	L21UG32B	18UB6CB
C21G43B	18B6CB	L21UG37B	18UB6CB
C21G44B	18B6CB	T21G1B	18A6TB
C21UG2B	18UA6CB	T21G2B	18A6TB
C21UG3B	18UA6CB	T21G10C	18B6TC
C21UG12B	18UB6CB	T21G11B	18B6TB
C21UG13B	18UB6CB	T21G12B	18B6TB
C21UG14B	18UB6CB	T21G13B	18B6TB
C21UG22B	18UB6CB	T21UG1B	18UA6TB
C21UG23B	18UB6CB	T21UG2B	18UA6TB
C21UG24B	18UB6CB	T21UG10C	18UB6TC
C21UG32B	18UB6CB	T21UG11B	18UB6TB
C21UG33B	18UB6CB	T21UG12B	18UB6TB
C21UG34B	18UB6CB	T21UG13B	18UB6TB
C21UG42B	18UB6CB	TS21G12	18D6T
C21UG43B	18UB6CB	TS21G13	18D6T

Run 20

COMPONENT CHANGE

L4 and L6 part numbers change from 72C132-38 to 72C132-39.

Run 21

TO IMPROVE VERTICAL CIRCUIT

C53, C54, C55, R70, R71, R72 are replaced with a couplate (Part #63C6-19). The values of the couplate are the same as the original wiring.

C4B and R27 are omitted; R79 connects to the 260V source.

Vertical Output tube (V9) is changed from a type 6DB5 to a type 6EM5.

TO IMPROVE SUPER RANGE FINDER CIRCUIT

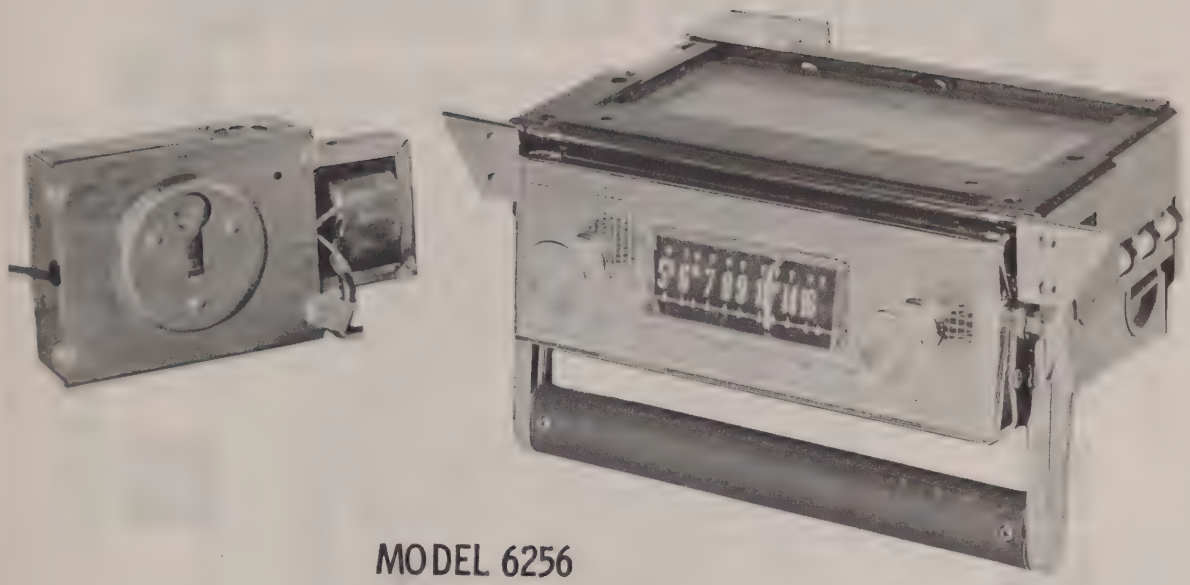
Super Range Finder Control (R4) is changed from 100K (Part #75D20-116) to 5meg (Part #75D20-119).

R40 is increased from 390K to 680K.

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ALLSTATE MODELS 6225, 6256
(Ch. 528.55040, 528.55041)

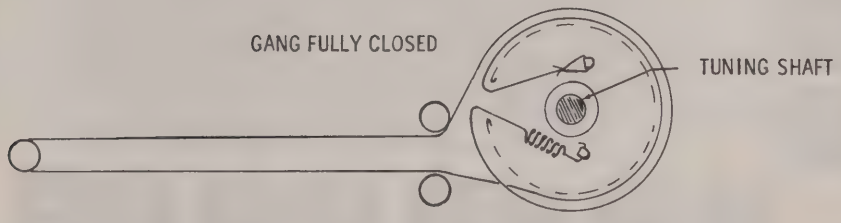


MODEL 6256

ALLSTATE MODELS 6225, 6256
(Ch. 528.55040, 528.55041)

TRADE NAME	Allstate Models 6225, 6256 (Ch. 528.55040, 528.55041)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Battery Operated Automobile-Portable Transistorized AM Receiver
POWER SUPPLY	12 Volt Storage Battery (Car) 9 Volts DC (Portable)
RATING	380MA @ 12.6 Volts DC (Car) 11.2MA @ 9 Volts DC (Portable)
TUNING RANGE—BROADCAST	535 — 1630KC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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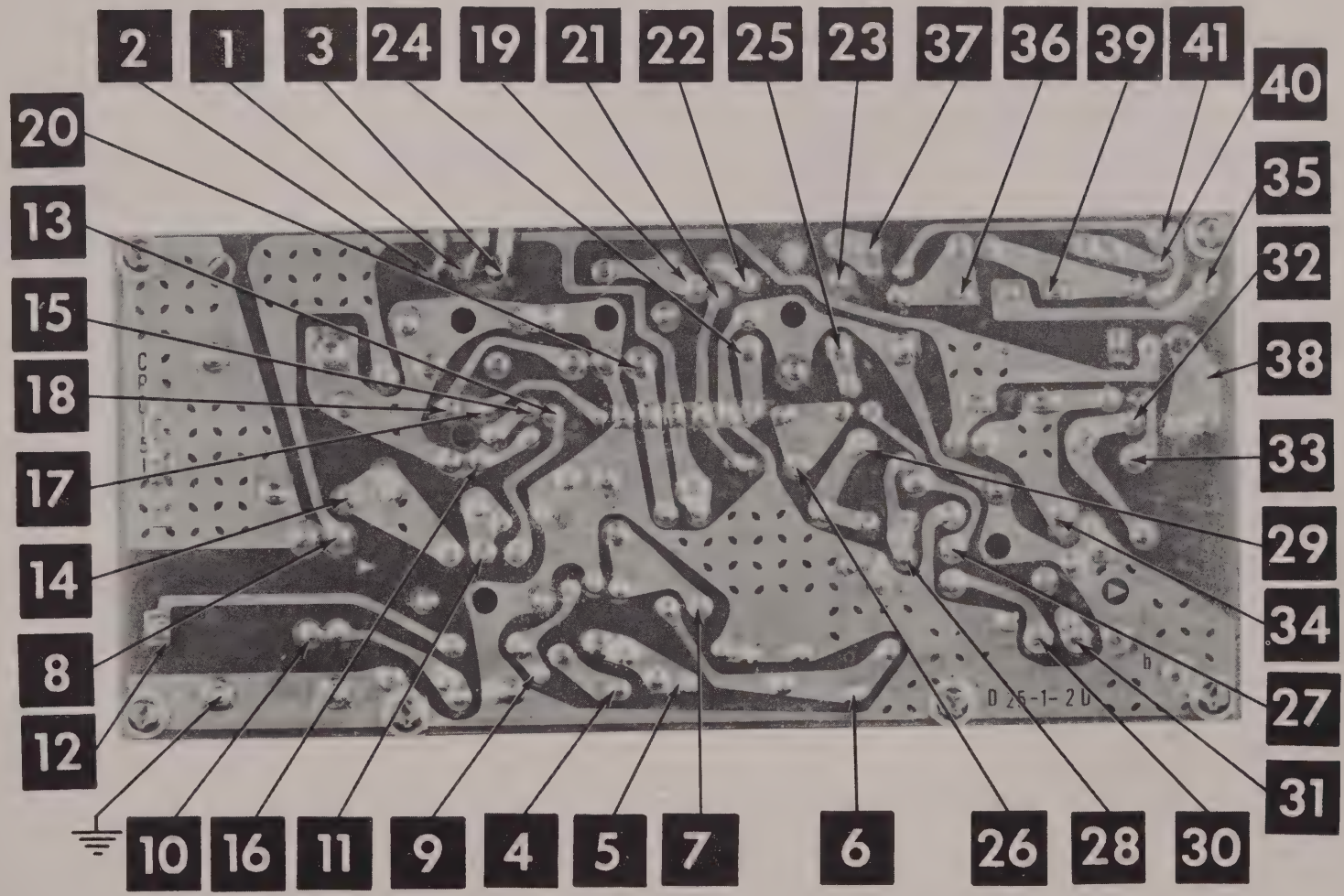

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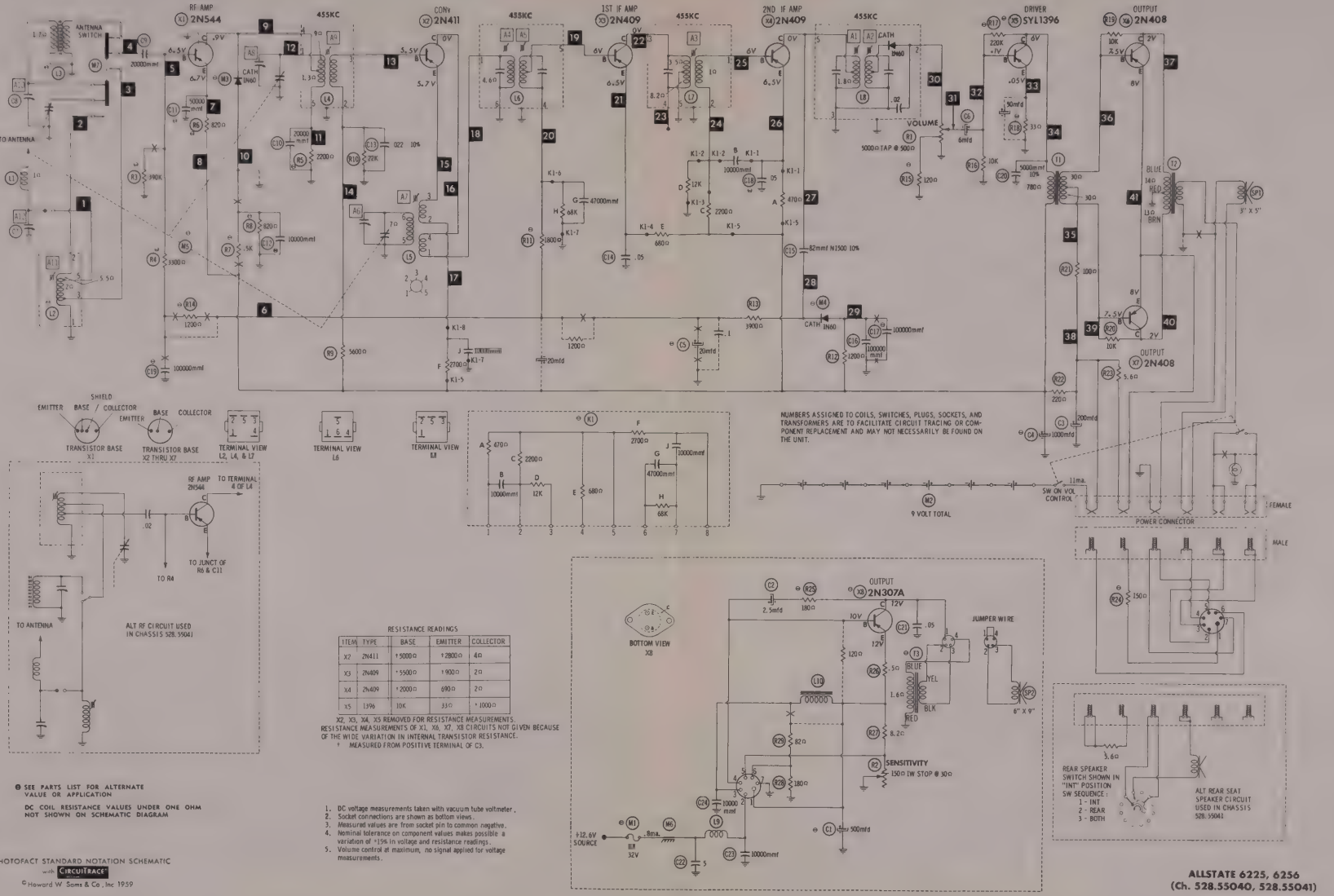
PRINTED BOARD



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X2	2N411	†5000Ω	†2800Ω	4Ω
X3	2N409	†5500Ω	†900Ω	2Ω
X4	2N409	†2000Ω	690Ω	2Ω
X5	1396	10K	33Ω	†1000Ω

X2, X3, X4, X5 REMOVED FOR RESISTANCE MEASUREMENTS.
RESISTANCE MEASUREMENTS OF X1, X6, X7, X8 CIRCUITS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM POSITIVE TERMINAL OF C3.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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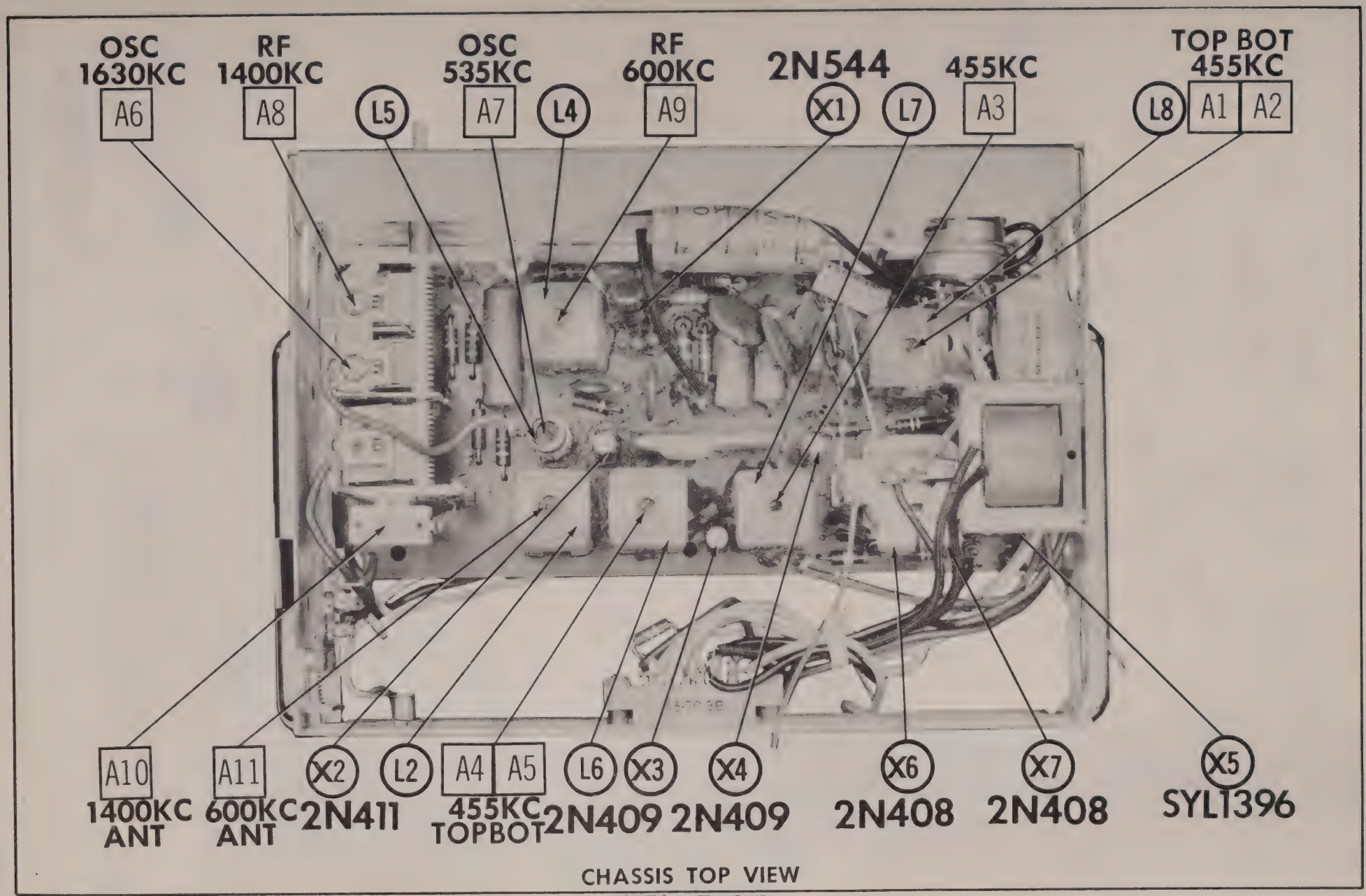
ALLSTATE 6225, 6256 (Ch. 528.55040, 528.55041)



CHASSIS TOP VIEW

MODEL 6225

ALLSTATE

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A5, A7, A9, A10, A11.. GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A6, A8..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to base of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4, A5	Adjust for maximum output.
2.	Fig. 1	"	1630KC	"	"	A6	"
3.	"	"	535KC	Tuning gang fully closed.	"	A7	Adjust for maximum output. Repeat Steps 2 and 3 until no further improvement can be noted.
4.	"	High side to base of RF Amp. Low side to chassis.	1400KC	Tune to 1400KC signal.	"	A8	Adjust for maximum output.
5.	"	"	600KC	Tune to 600KC signal.	"	A9	Adjust for maximum output. Repeat Steps 4 and 5.
6.		Loop	1400KC	1400KC	"	A10	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.	Fig. 1	Thru dummy to antenna receptacle.	600KC	600KC	"	A11	Actuate antenna switch with a screwdriver and adjust A11 for maximum output.
8.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A12 for maximum output.						

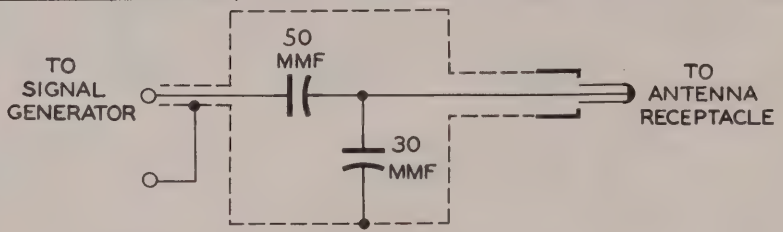
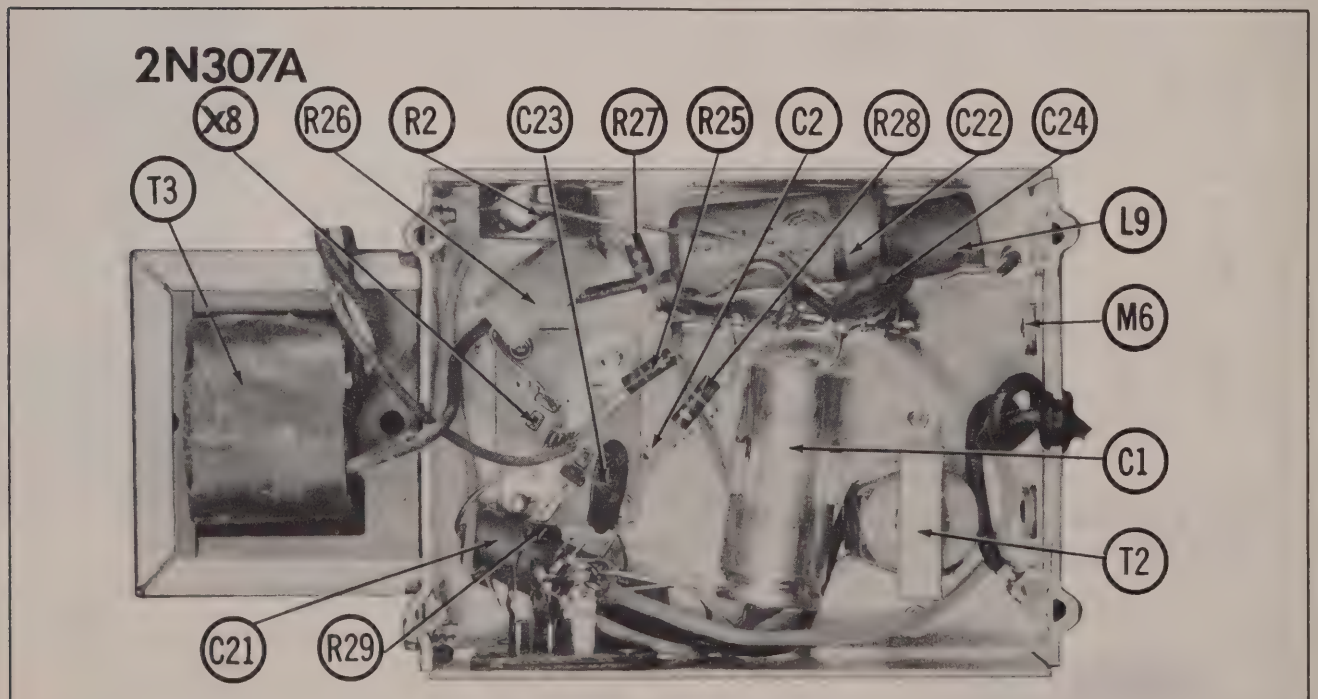


FIG.1



POWER CHASSIS

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N544	RF Amplifier		2N544		2N544	PNP
X2	2N411	Converter		2N411	2N486	2N411	PNP
X3	2N409	1st IF Amplifier		2N409	2N484	2N409	PNP
X4	2N409	2nd IF Amplifier		2N409	2N483	2N409	PNP
X5	①SYL1396	Driver	2N306		2N362	2N306	NPN
X6	2N408	Output		2N408	2N632	2N408	PNP } Matched
X7	2N408	Output		2N408	2N632	2N408	PNP } Pair
X8	②2N307A	Output	2N256A			2N307A	PNP

① Ch. 528.55041 use 2N1251 in this application.
② Alternate type #2N555 or CTP1104.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ALLSTATE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	500	15	18-36-5 ①	PRS1220	BR5001	TC1505	TD-500-15	TVA-1162	
C2	2.5	15	18-87-5	PWE25003	EC3-6	TT150X3	ML2-15	TE-1150	
C3	200	15	18-86-5	PRS1210	BR2501	TC1502	TD-250-15	TE-1164	
C4	1000	15	18-90-5	PRS1230	BR10001	TC1501	TD-1000-15	TVA-1163	②
C5	20	15	18-82-5	PWE25020	EC20-15	TT15X20	ML20-15	TE-1157	③
C6	6	15	18-84-5	XPP-15006	EC6-25	TT25X5	ML6-15	TE-1153	

① Alternate Part #18-85-5 used in Ch. 528.55041.
② Some versions of Ch. 528.55040 may use 500mfd @15V in this application. (Part #18-85-5)
③ Not used in Chassis 528.55041.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ALLSTATE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7				19-193-0						
C8				19-187-0						
C9	20000			15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C10	20000			15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C11	50000			20-140-0	BPD-05	DD-503	H-05S5	TA-150	5HK-S5	①
C12	10000			15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	②
C13	.022	200	10%	16-22327	V84C2S22 10%	DD-203	PM2S22	GTM-2122	4TM-S22	
C14	.05	12		20-57-1	V842S5	DD-503	H-05S3	TA-150	5HK-S5	
C15	82		N1500 10%	15-82011						
C16	100000			20-139-0		DF-104	H-05P1	TA-010	5HK-P1	
C17	100000			20-139-0		DF-104	H-05P1	TA-010	5HK-P1	③
C18	.05	12		20-57-1	V842S5	DD-503	H-05S5	TA-150	5HK-S5	④
C19	100000			20-139-0		DF-104	H-05P1	TA-010	5HK-P1	③
C20	5000		10%	15-50211	DI-5000 10%		WMF1D47E	GTM-125	10TS-D5	
C21	.05	200		16-50323	P288N-05	DF-503	CUB2S5	GTM-215	2TM-S5	
C22	.5	100		20-21-1	P288N-5		CUB2P5	GTM-105	2TM-P5	
C23	10000			15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	10000			15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

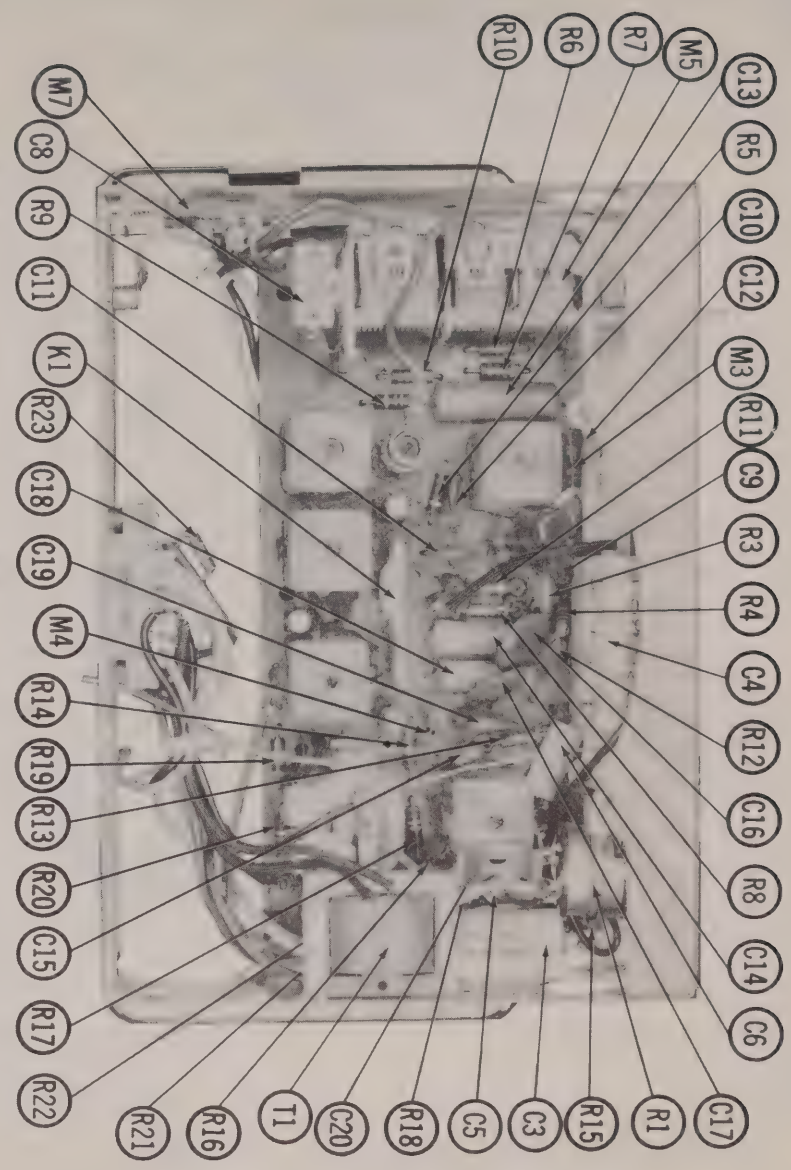
① Chassis 528.55041 use .1mfd in this application.
② Not used in Chassis 528.55041.
③ Not used in some versions.
④ Part of Component combination part #13-38-3 in Ch. 528.55041.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ALLSTATE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5000Ω	½	24-335-0					Volume, Tap @ 500Ω
B	Switch							Off-On
R2	150Ω	1(WW)	24-8-3		39-150 *	112-150 *	FL-150 *	Sensitivity, Stop at 30Ω

* Use 30Ω series resistor.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	390K	Note 1
R4	3300Ω	Note 2
R5	2200Ω	Note 3
R6	820Ω	Note 4
R7	15K	Note 1
R8	820Ω	Note 1
R9	5600Ω	
R10	22K	
R11	1800Ω	Note 5

ITEM No.	RATING	REMARKS
R12	1200Ω	
R13	3900Ω	
R14	1200Ω	Note 2
R15	120Ω	Note 6
R16	10K	
R17	220K	Note 7
R18	33Ω	Note 8
R19	10K	
R20	10K	

ITEM No.	RATING	REMARKS
R21	100Ω	
R22	220Ω	
R23	5.6Ω	
R24	150Ω	Note 9
R25	180Ω	Note 10
R26	.5Ω	#61-149-0
R27	8.2Ω	
R28	180Ω	
R29	82Ω	

Note 1. Not used in Chassis 528.55041.
Note 2. Some versions may use a single 4700Ω to replace R4 & R14.
Note 3. Ch. 528.55041 uses 1200Ω in this application (Part #60-12201).
Note 4. Ch. 528.55041 uses 1000Ω in this application (Part #60-10201).
Note 5. Ch. 528.55041 uses 470Ω in this application (Part #60-47101).
Note 6. Some versions may use 22Ω in this application (Part #60-22001).
Note 7. Ch. 528.55041 uses 82K in this application (Part #60.82301).
Note 8. Ch. 528.55041 uses 470Ω in this application (Part #60-47101).
Note 9. Not used in some versions.
Note 10. Some versions of Ch. 528.55040 may use 120Ω in this application (Part #60-12101).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ALLSTATE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	10-13-1						①
L2	Ant. Coil	10-25-0						②
L3	Loopstick	84-7155						
L4	RF Coil	10-24-0						
L5	Osc. Coil	10-49-4						
L6	1st IF Trans.	10-103-2						
L7	2nd IF Trans.	10-104-2						
L8	3rd IF Trans.	10-105-2						
L9	"A" Lead Choke	10-5-5						

① Ch. 528.55041 uses Part #10-30-0.
② Includes handle. Ch. 528.55041 uses Part #84-7924.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	.450A	.5Ω	.005 HY	80-7-6						

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ALLSTATE PART No.	REPLACEMENT DATA
K1	Converter-IF Network	10000mmf, 10000mmf, 47000mmf, 470Ω, 680Ω, 2200Ω, 2700Ω, 12K, 68K	13-28-3 ①	

① Ch. 528.55041 uses Part #13-38-3 which includes C18 with the above values.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO: PRI.	SEC.	REPLACEMENT DATA: ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.5	1	80-84-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	300Ω CT	6-8Ω	80-85-1							①Ch. 528.55041 Uses part # 80-76-1
T3	60Ω	6-8Ω	80-86-1①							

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ALLSTATE PART No.	QUAM PART No.	NOTES
SP1	3"x 5"	PM	6-8Ω	33-391-4		
SP2	6"x 9"	PM	6-8Ω	33-392-4	69A3Z6.6	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ALLSTATE PART No. FUSE	ALLSTATE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	SFE	6A 32V	① T43-28-0	84-7198	307006. (SFE 6A 32V)	155006	SFE 6	HlG

① Some versions may use Part #43-27-0.

BATTERIES

ITEM No.	VOLTAGE	ALLSTATE PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M2	9V	4659		1		935		M14R	6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ALLSTATE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N60 *		1N60	1N60	1N60	Detector (Pigtail)
M4	1N60 *		1N60	1N60	1N60	AVC (Pigtail)

* 1N805 may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	ALLSTATE PART No.	NOTES
M5	Tuning Cap	19-28-3	3 Gang Ch. 528.55040
	Tuning Cap	19-32-3	3 Gang Ch. 528.55041
M6	Spark Plate	31-425-0	
M7	Switch		Antenna

CABINETS & CABINET PARTS

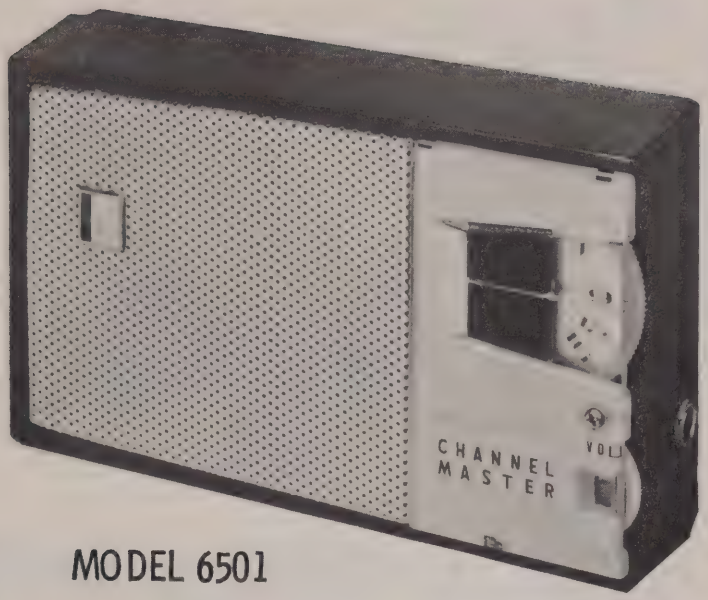
When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder with CIRCUITRACE*
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

CHANNEL MASTER
MODELS 6501, 6502



MODEL 6501

CHANNEL MASTER
MODELS 6501, 6502

TRADE NAME	Channel Master Models 6501, 6502
MANUFACTURER	Channel Master Corp., Ellenville, N. Y.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
RATING	4.3MA @ 9 Volts DC (No signal, Min. Volume) 5MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A4, A6 ..... GENERAL CEMENT #9087, 9089
WALSCO #2528

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1600KC	1600KC	"	A4	"
3.		"	600KC	Tune to 600KC signal	"	A5	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
4.		"	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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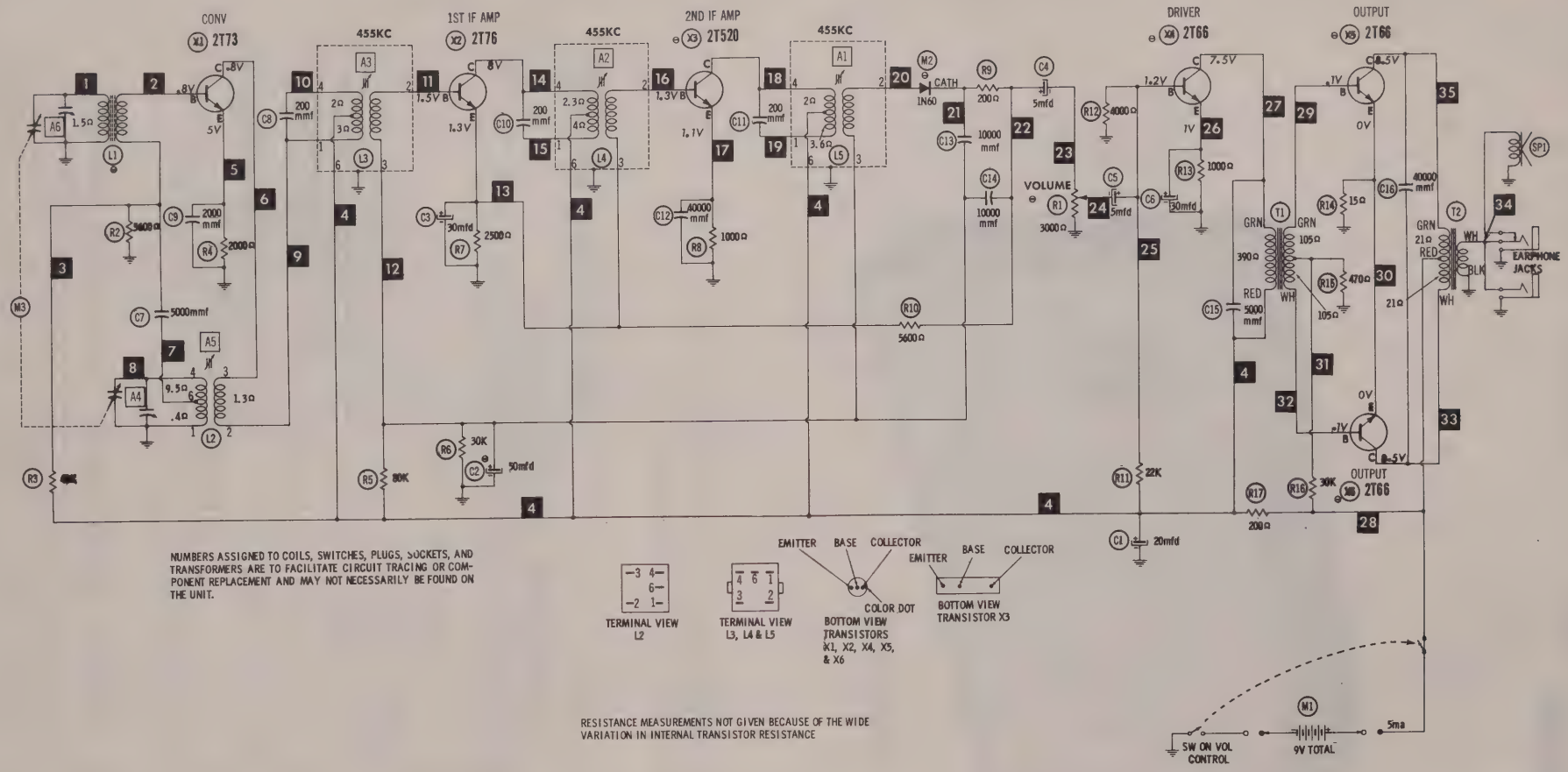
JF366

SET 462 FOLDER 5



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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CHANNEL MASTER MODELS 6501, 6502

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2T73	Converter				2N212	NPN
X2	2T76	1st IF Amplifier				2N233A	NPN
X3	2T520①	2nd IF Amplifier				2N233A	NPN
X4	2T66 ②	Driver	2N438	2N649		2N214	NPN
X5	2T66 ②	Output	2N438	2N649		2N214	NPN
X6	2T66 ②	Output	2N438	2N649		2N214	NPN

① 2T76 Alternate Type. ② 2T65 Alternate Type.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Channel Master PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	20	9	A011	BCD10025	ECPB210				Note 1
C2	50	3		BCD3050	ECPB15				
C3	30	6	A009	BCD6035	ECPB112				
C4	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C5	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C6	30	6	A009	BCD6035	ECPB112				

Note 1. Some versions may use 30mfd @ 6V in this application (Part #A009).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Channel Master PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	5000			A004	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C8	200			A013	SI 200	D6-201	L10T2	B-322	5GA-T2	
C9	2000			A007	BPD-002	DD-202	BYA10D2	B-220	5HK-S2	
C10	200			A013	SI 200	D6-201	L10T2	B-322	5GA-T2	
C11	200			A013	SI 200	D6-201	L10T2	B-322	5GA-T2	
C12	40000			A015			BYB6S4		5HK-S4S *	
C13	10000			A006	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	10000			A006	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	5000			A004	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C16	40000			A015			BYB6S4		5HK-S4S *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Channel Master PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B	3000Ω Switch	1/4	E006	B16-212 Not Req.				Volume Note 1 Power Off-On

Note 1. Some versions may use 5000Ω volume with switch (Part #E005).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	5600Ω	
R3	40K	
R4	2000Ω	
R5	80K	
R6	30K	
R7	2500Ω	

ITEM No.	RATING	REMARKS
R8	1000Ω	
R9	200Ω	
R10	5600Ω	
R11	22K	
R12	4000Ω	
R13	1000Ω	

ITEM No.	RATING	REMARKS
R14	15Ω	
R15	470Ω	
R16	30K	
R17	200Ω	

PRINTED BOARD

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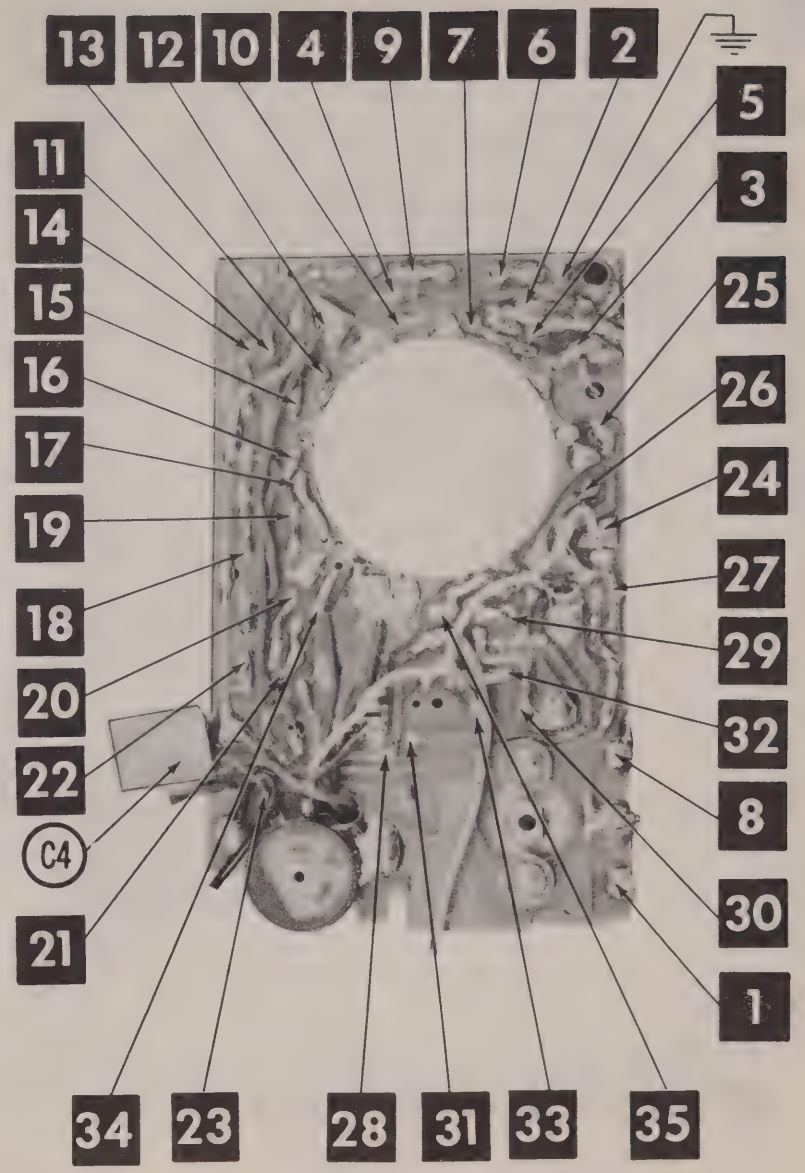


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Channel Master PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	E021						
L2	Osc. Coil	F135						
L3	1st IF Trans.	C021						
L4	2nd IF Trans.	C022						
L5	3rd IF Trans.	C023						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Channel Master PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	C019	TR-2		TA-30	TR-2		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Channel Master PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	500Ω CT	6-8Ω	C020	TR-102			TA-21	TR-102		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Channel Master PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω	G091		

BATTERIES

ITEM No.	VOLTAGE	Channel Master PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		TR-146R	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Channel Master PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60 *	F137	1N60	1N60	1N60	Detector (Pigtail)

* Some versions may use 1T23 in this application

MISCELLANEOUS

ITEM No.	PART NAME	Channel Master PART No.	NOTES
M3	Tuning Cap.	A001	2 Gang

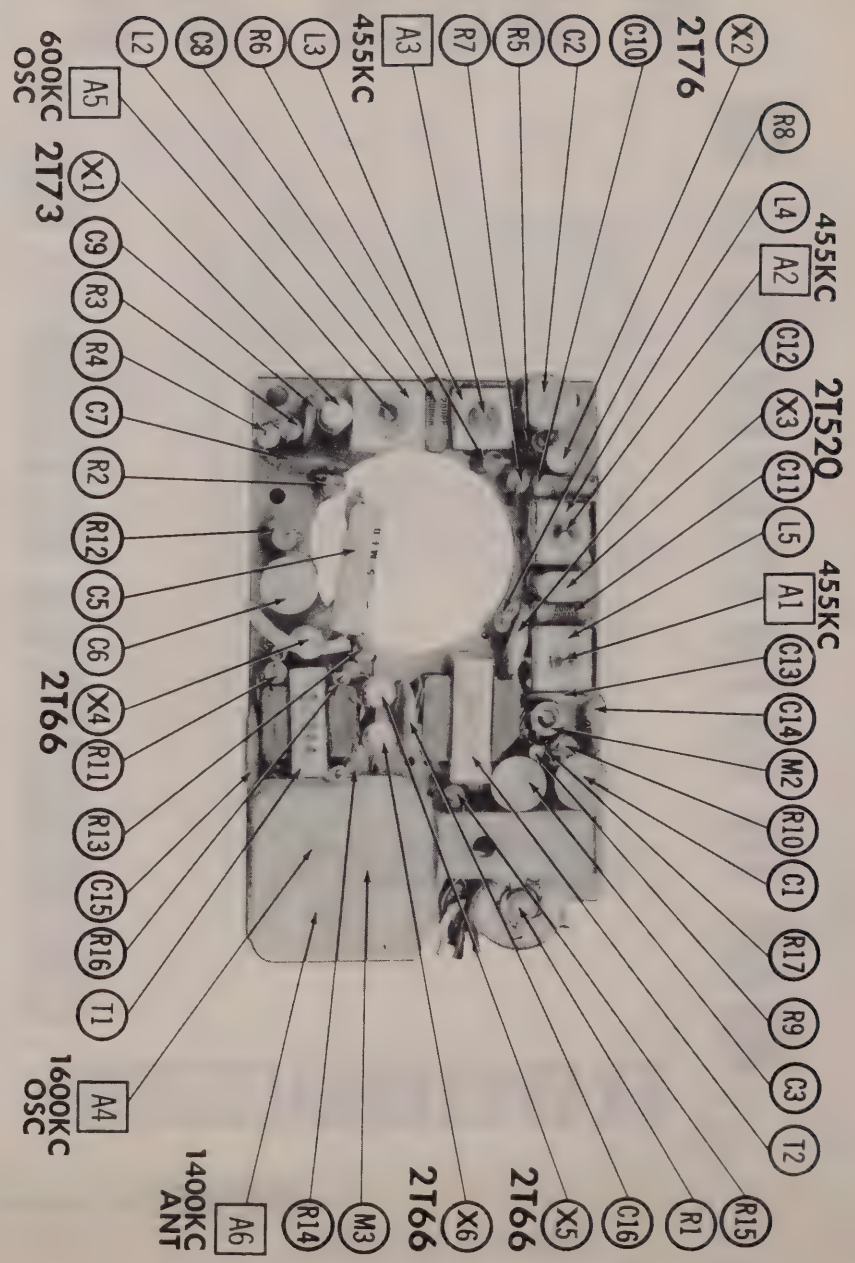
CABINETS & CABINET PARTS

When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

Howard W. Sams

CROWN MODEL TR-830

CROWN MODEL TR-830

CROWN MODEL TR-830

TRADE NAME	Crown Model TR-830
IMPORTER	Shriro, Inc., 276 Fourth Ave., New York 10, N. Y.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	525 - 1650KC
RATING	6.7MA @ 9 Volts DC (No Signal, Min. Volume) 7MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A3, A4, A5...GENERAL CEMENT #9087, 9089
WALSCO #2528

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	525KC	Tuning gang fully closed	"	A3	"
3.		"	1650KC	Tuning gang fully open	"	A4, A5	"
4.		"	650KC	650KC	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JF260

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2 N411①	Converter		2N411		2N411	PNP
X2	2N409②	IF Amplifier		2N409		2N409	PNP
X3	2N407③	Driver		2N407		2N407	PNP
X4	2N407③	Output		2N407		2N407	PNP

① Some versions may use GT-761R in this application.
② Some versions may use GT-760R in this application.
③ Some versions may use GT-81 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	CROWN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	50	10		XPP-10050	NLW50-10	TT10X50	ML50-15	TE-1119	
C2	6	6		XPP-6006	NLW6-15	TT6X50	ML6-6	TE-1085	
C3	30	6		XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C4	50	6		XPP-6050	NLW50-6	TT6X50	ML50-6	TE-1100	
C5	50	6		XPP-6050	NLW50-6	TT6X50	ML50-6	TE-1100	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	CROWN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C7	200				SI 200	D6-201	L10T2	UC-532	5GA-T2	
C8	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C9	5				SI 5	D6-050	L10V5	ZT-555	5GA-V5	
C10	20000				BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C11	5		±.5mmf		NPO-SI 5		L10V5		5GA-V5S±.5mmf*	
C12	200				SI 200	D6-201	L10T2	UC-532	5GA-T2	
C13	20000				BPD-02	DD-203	BYB6S2	B-120	5HK-D2	
C14	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CROWN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	1/4		B16-216				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

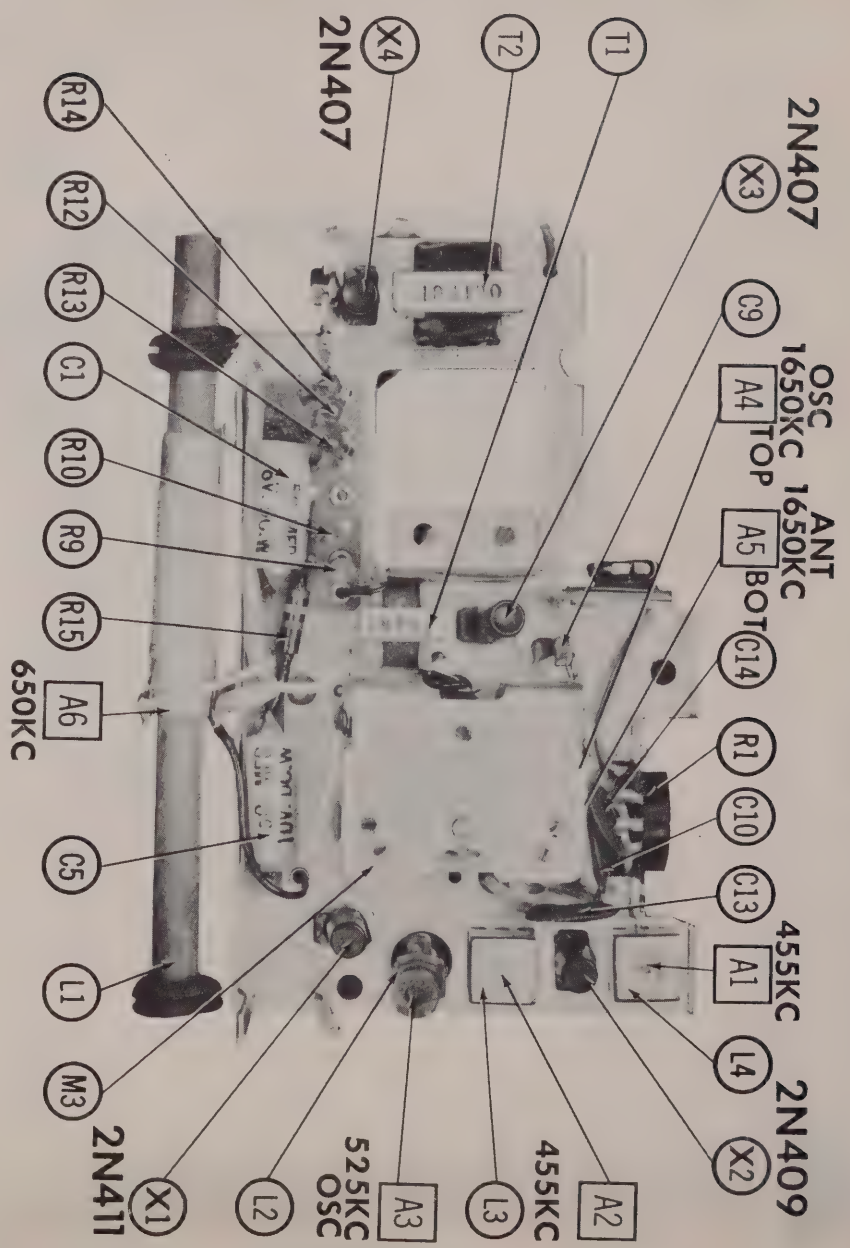
ITEM No.	RATING	REMARKS
R2	18K	
R3	47K	
R4	5100Ω	
R5	1000Ω	
R6	1000Ω	

ITEM No.	RATING	REMARKS
R7	10K	
R8	150K	
R9	4700Ω	Note 1
R10	33K	
R11	1000Ω	

ITEM No.	RATING	REMARKS
R12	560Ω	
R13	8200Ω	Note 1
R14	56Ω	
R15	150Ω	

Note 1. Value may vary. Replace with original value.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		CROWN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	Input IF		16-9016	16-9016		9-C1		
L4	Output IF		16-9017	16-9017		9-C2		

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CROWN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5	1							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	CROWN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	360Ω	10Ω		TR-19			TA-20	TR-19		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CROWN PART No.	QUAM PART No.	
SP1	2½"	PM	10-12Ω			

BATTERIES

ITEM No.	VOLTAGE	CROWN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		CROWN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	SD-46		1N60	1N60	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	CROWN PART No.	NOTES
M3	Tuning Cap.		2 Gang (Ant. 10—232mmf, Osc. 12—105mmf)

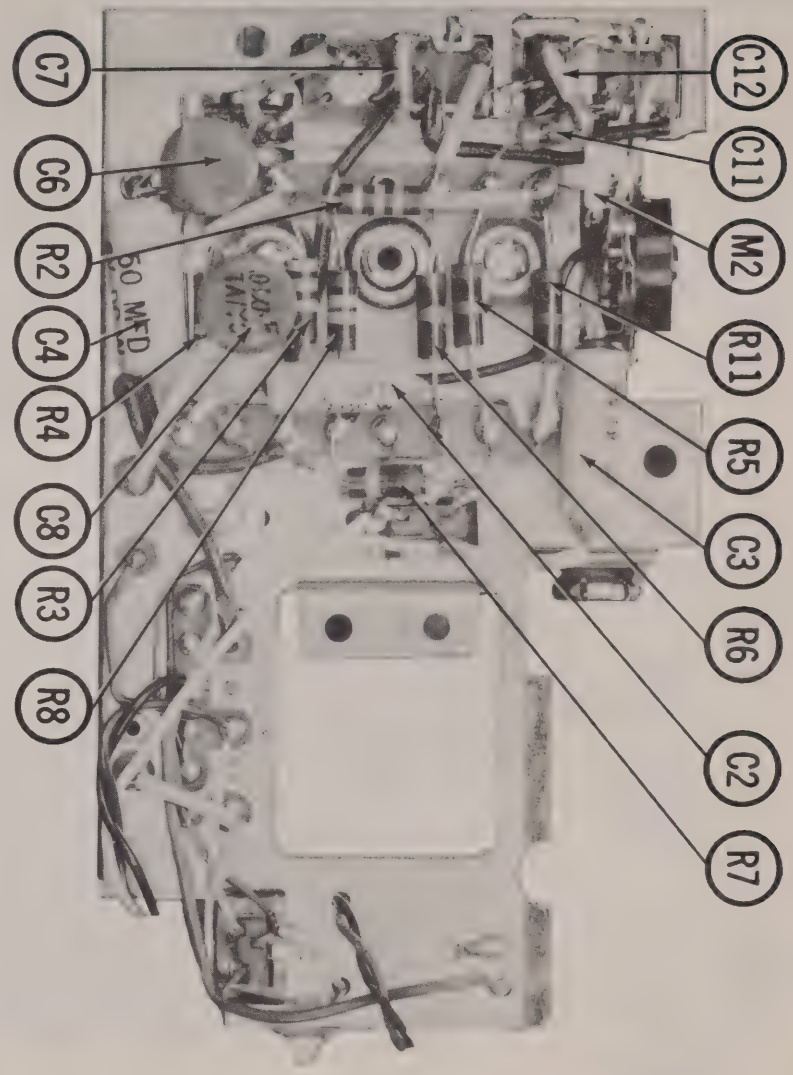
CABINETS & CABINET PARTS

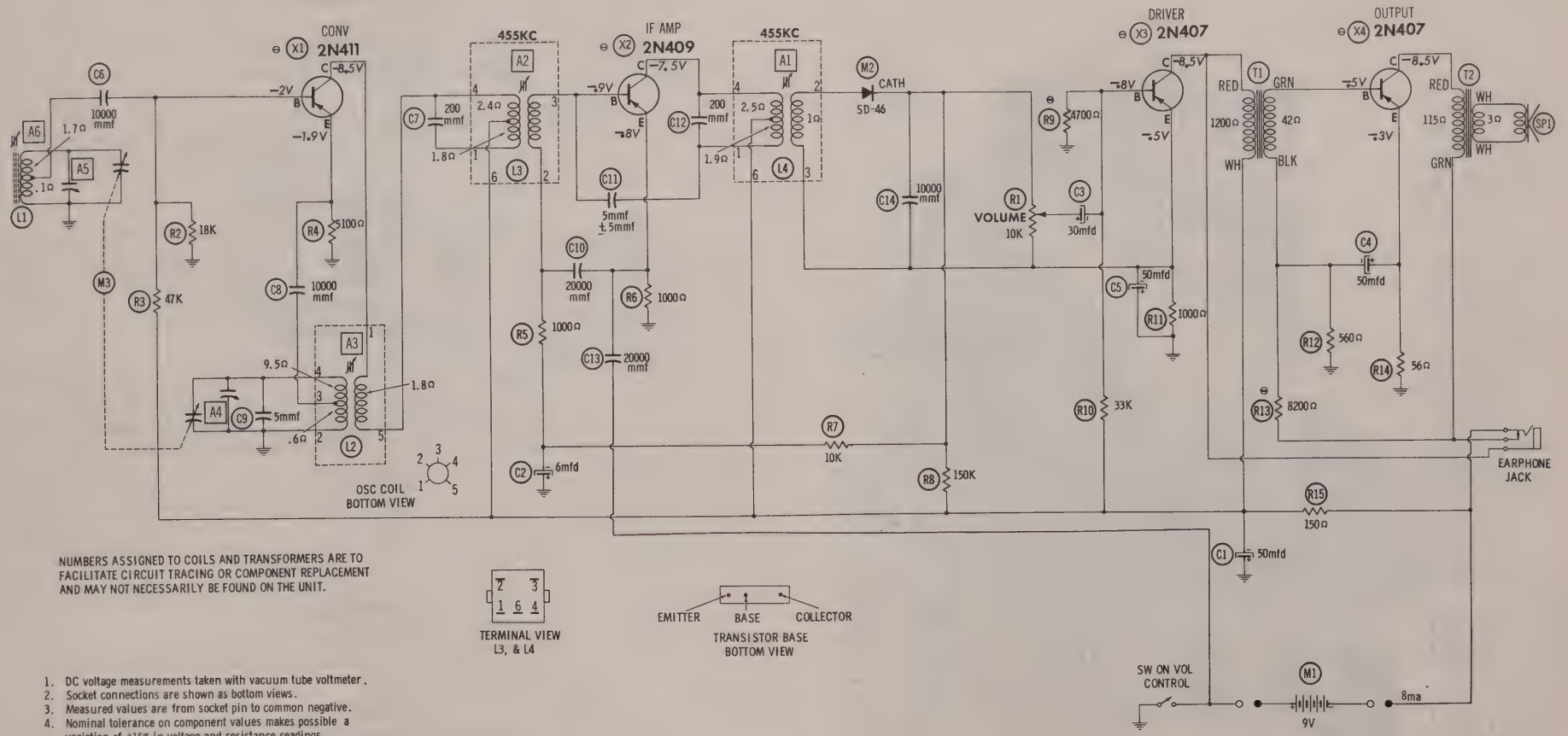
When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS BOTTOM VIEW





NUMBERS ASSIGNED TO COILS AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N411	15K	5100Ω	† 155Ω
X2	2N409	14K	1000Ω	† 150Ω
X3	2N407	4300Ω	1000Ω	† 1200Ω
X4	2N407	600Ω	56Ω	† 115Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R15 AND M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CROWN MODEL TR-830

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DYNAMIC MODEL ST-3000PA

DYNAMIC MODEL ST-3000PA

DYNAMIC MODEL ST-3000PA

TRADE NAME	Dynamic Model ST-3000PA		
MANUFACTURER	Dynamic Electronics, Inc., 87-46 123rd St., Richmond Hill, L. I., N. Y.		
TYPE SET	AC Operated 10 Tube Stereo Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	105 Watts, 1.1 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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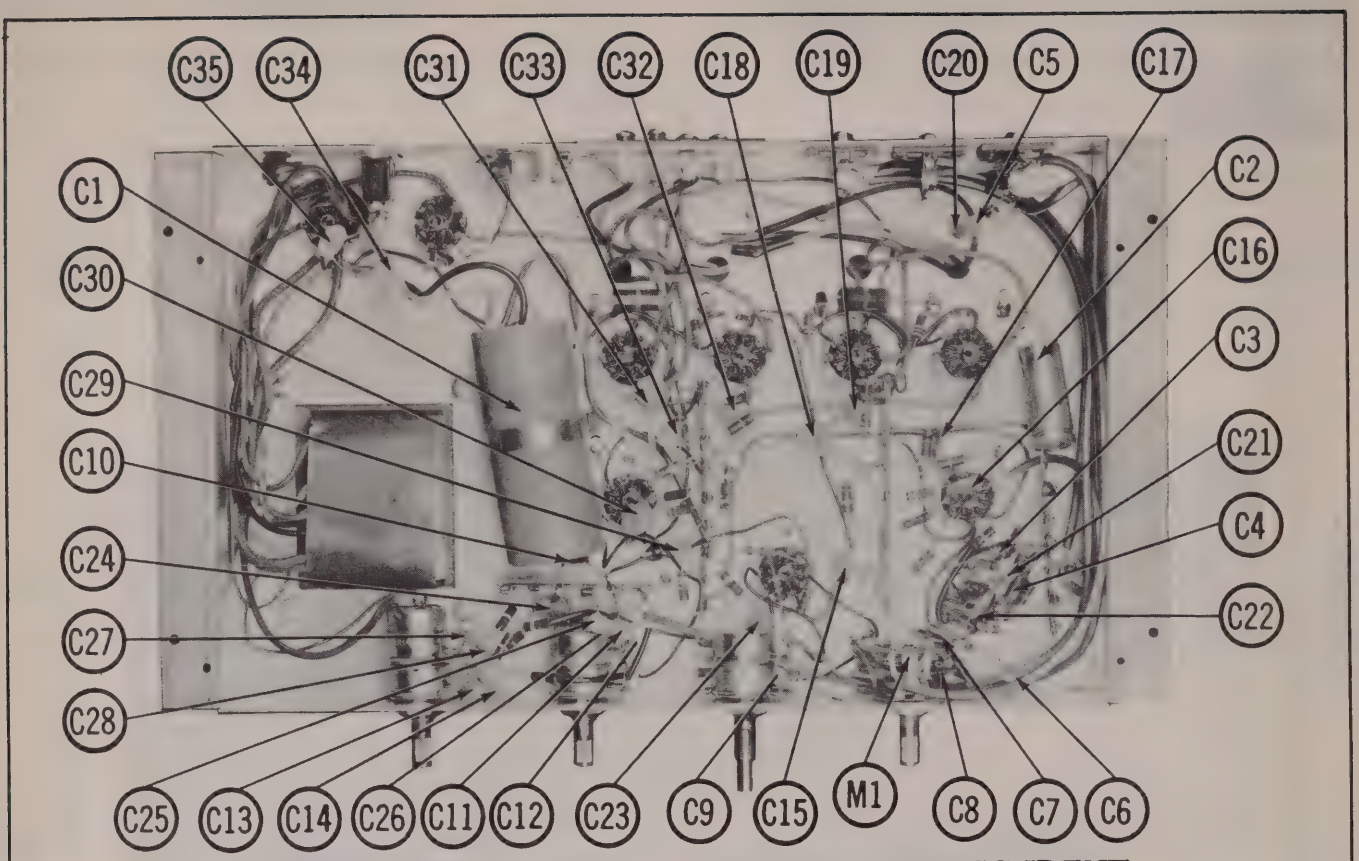
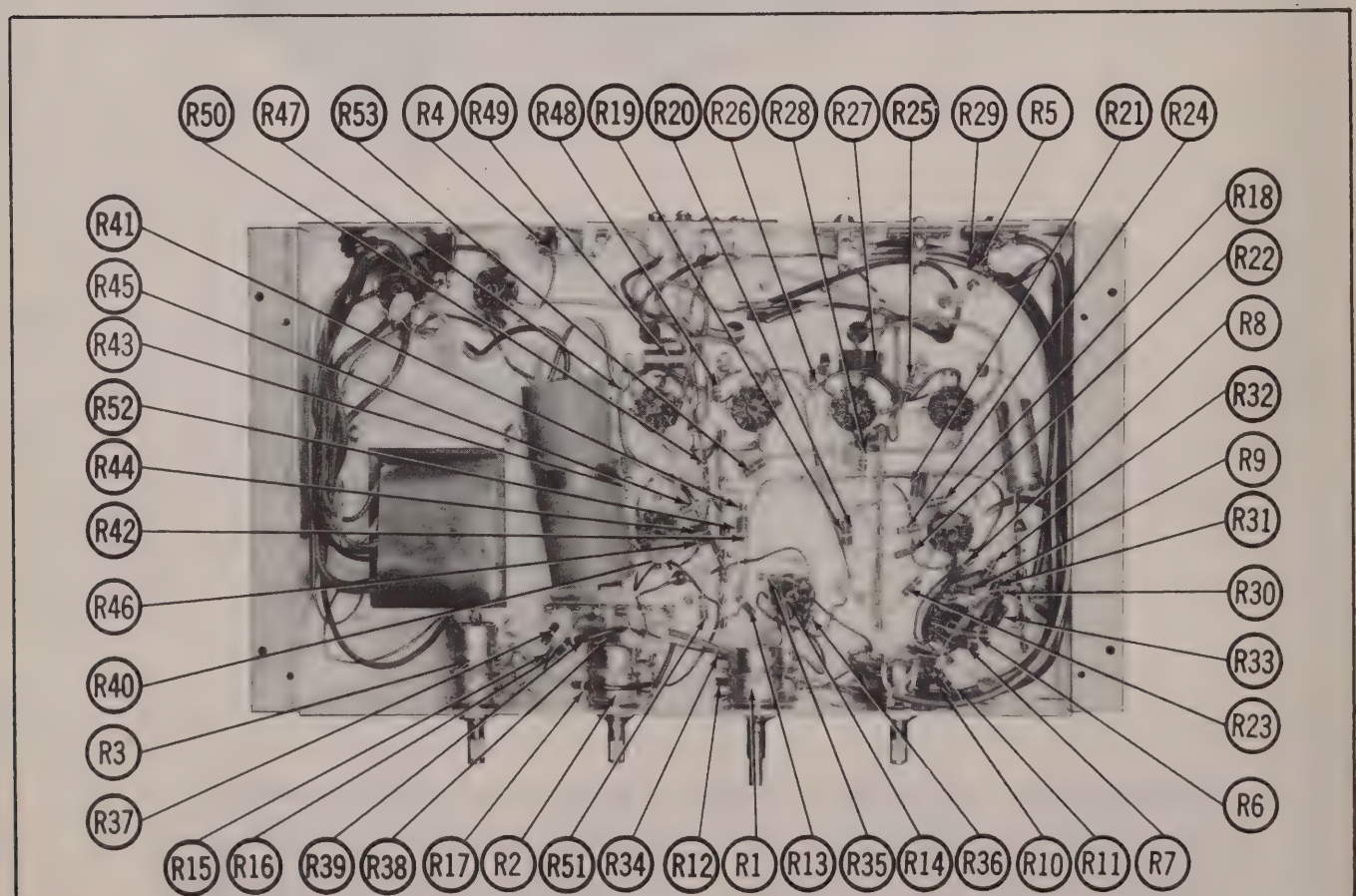


CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.



CHASSIS BOTTOM VIEW - RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Channel 1 & 2 Preamp.	12AX7	
V2	Channel 1 & 2 AF Amp.	12AX7	
V3	Channel 1 AF Amp. - Phase Inverter	12AX7	
V4	Channel 1 Output	EL84/6BQ5	
V5	Channel 1 Output	EL84/6BQ5	

ITEM No.	USE	TYPE	NOTES
V6	Channel 2 AF Amp. - Phase Inverter	12AX7	
V7	Channel 2 Output	EL84/6BQ5	
V8	Channel 2 Output	EL84/6BQ5	
V9	Rectifier	EZ81/6CA4	
V10	Rectifier	EZ81/6CA4	

ELECTROLYTIC CAPACITORS

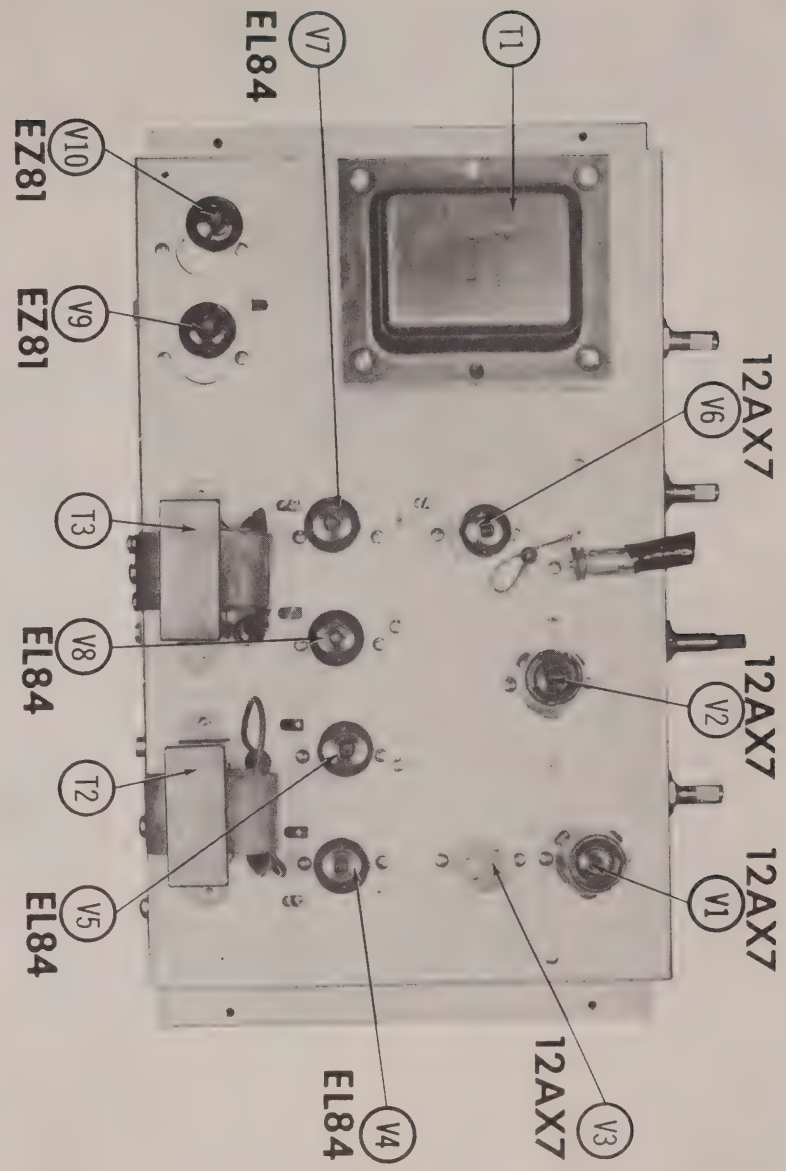
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	DYNAMIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	400		PR4-200	BBRQ0174	WQ795	CDB-Q-0174	TVA-4750	
B	40	400							
C	20	400							
C2	4	400		PRS450V4	BR445	TC70	TD-4-450	TVA-1702	
C3	10	6		XPP6010	NLW10-6	TT6X10	ML10-6	TE-1087	
C4	10	6		XPP6010	NLW10-6	TT6X10	ML10-6	TE-1087	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	DYNAMIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C6	100		N150							
C7	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C9	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	100		N150							
C12	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C13	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C14	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C16	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C18	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C19	56		N150							
C20	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C21	100		N150							
C22	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C23	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C24	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C25	100		N150							
C26	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C27	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C28	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C29	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C30	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	56		N150							
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DYNAMIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg *		CM23571					Loudness, Channel 2
B	1meg *							Loudness, Channel 1
R2A	1meg		CM23118	B-70	AD47-1meg-Z	Q13-137		Treble, Channel 2
B	1meg			SR-70	Not Req.	M13-137	UF4008	Treble, Channel 1
C	Shaft			Not Req.	KSS-3	Not Req.		
R3A	1meg		CM23573	B-70	AD47-1meg-Z	Q13-137		Bass, Channel 2
B	1meg			SR-70	Not Req.	M13-137	UE4043-S	Bass, Channel 1
C	Shaft			Not Req.	KSS-3	Not Req.		
D	Switch			KR-1	SWE-12	76-1		
R4A	100Ω	2(WW)	CM21465	WN-101	A43-100	W11-084	FL100P	Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req	

* Tap ② 250K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	27K	
R6	100K	
R7	150K	
R8	220K	
R9	1000Ω	
R10	2.2meg	
R11	220K	
R12	68K	
R13	150K	
R14	2200Ω	(1000Ω) *
R15	220K	
R16	15K	
R17	150K	
R18	150K	
R19	150K	
R20	3300Ω	
R21	1000Ω	

* Alternate

ITEM No.	RATING	REMARKS
R22	1meg	
R23	150K	
R24	3300Ω	
R25	470K	
R26	470K	
R27	150Ω 2W	
R28	27K	
R29	27K	
R30	100K	
R31	150K	
R32	220K	
R33	1000Ω	
R34	68K	
R35	150K	
R36	2200Ω	(1000Ω) *
R37	220K	
R38	15K	

ITEM No.	RATING	REMARKS
R39	150K	
R40	150K	
R41	150K	
R42	3300Ω	
R43	1000Ω	
R44	1meg	
R45	150K	
R46	3300Ω	
R47	470K	
R48	470K	
R49	150Ω 2W	
R50	27K	
R51	47K	
R52	68K	
R53	10K	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	DYNAMIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 1.1A	540VCT ② .150A	6.3V ② 6.4A	EH-248	26R44 ①	P-2872		P-8172 ①	26R44 ①	

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DYNAMIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω CT	16Ω Taps ② 8Ω, 4Ω		24S17	A-2904	AU-600	A-3852	24S17	S-55Z	
T3	6000Ω CT	16Ω Taps ② 8Ω, 4Ω		24S17	A-2904	AU-600	A-3852	24S17	S-55Z	

MISCELLANEOUS

ITEM No.	PART NAME	DYNAMIC PART No.	NOTES
M1	Switch		Function Selector

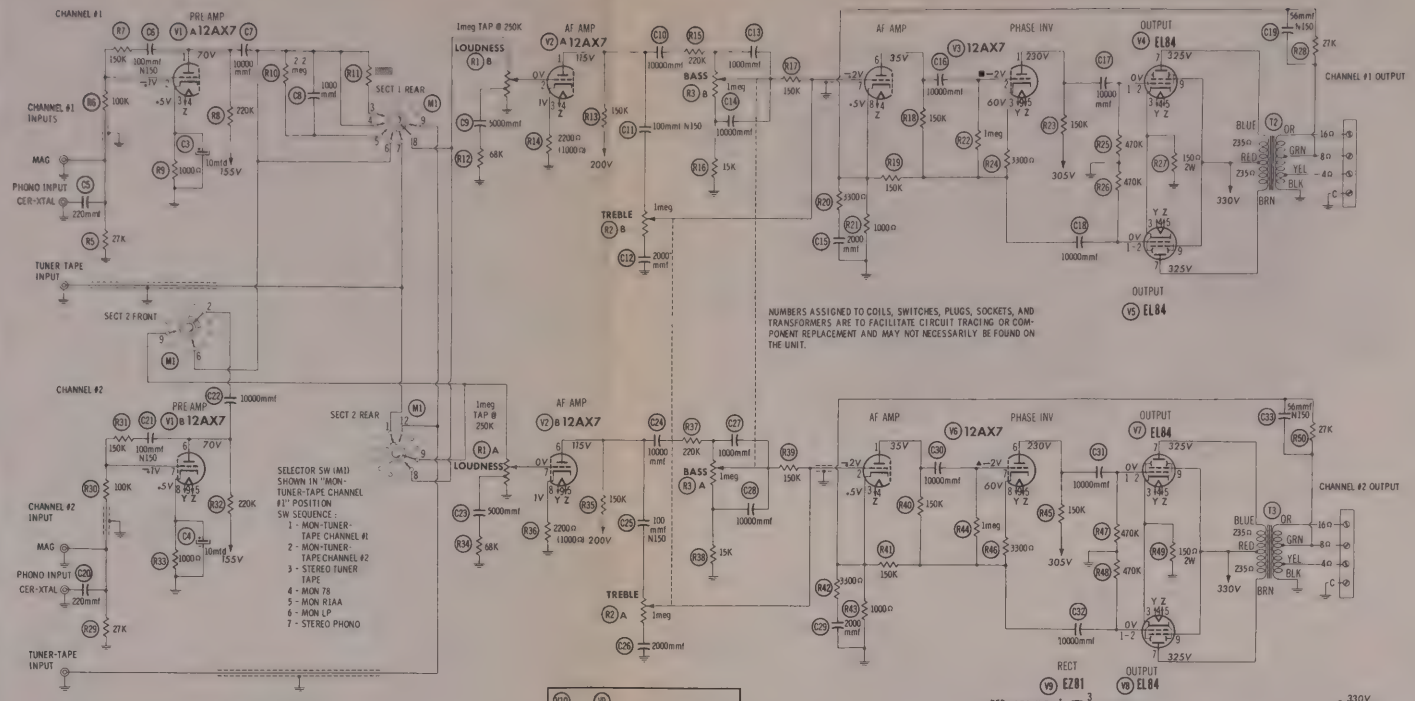
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑345K	127K	1000Ω	35Ω	35Ω	↑345K	127K	1000Ω	35Ω
V2	12AX7	↑230K	0Ω	2200Ω	35Ω	35Ω	↑230K	0Ω	2200Ω	35Ω
V3	12AX7	↑160K	1.1meg	155K	35Ω	35Ω	300K	165K	950Ω	35Ω
V4	EL84	470K	470K	150Ω	35Ω	35Ω	NC	↑235Ω	NC	↑0Ω
V5	EL84	470K	470K	150Ω	35Ω	35Ω	NC	↑235Ω	NC	↑0Ω
V6	12AX7	300K	↑165K	950Ω	35Ω	35Ω	↑160K	1.1meg	155K	35Ω
V7	EL84	470K	470K	150Ω	35Ω	35Ω	NC	↑235Ω	NC	↑0Ω
V8	EL84	470K	470K	150Ω	35Ω	35Ω	NC	↑235Ω	NC	↑0Ω
V9	EZ81	ZΩ	NC	¶	35Ω	35Ω	NC	ZΩ	NC	NC
V10	EZ81	26Ω	TP	¶	35Ω	35Ω	TP	26Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 3 OF V10
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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DYNAMIC MODEL ST-3000PA

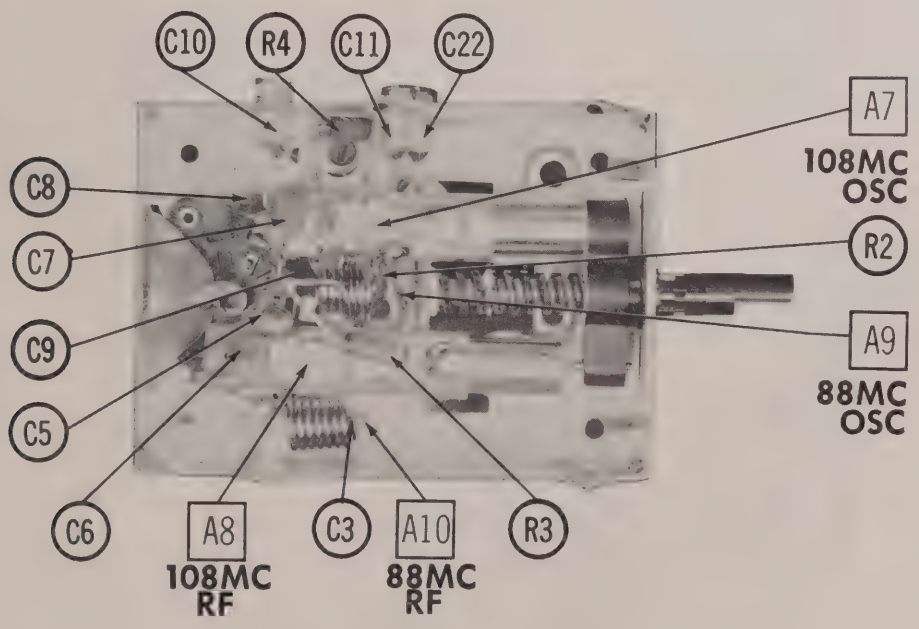
PHOTOFACT* Folder

EIA MEMBER

GRANCO MODEL 601

GRANCO MODEL 601

TRADE NAME	Granco Model 601
MANUFACTURER	Granco Products, Inc., 36-07 20th Ave., Long Island City 5, N. Y.
TYPE SET	AC Operated 5 Tube FM Receiver
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 33 Watts, .37 Amp. @117 Volts AC
FREQ. MOD.	88 – 108MC



GRANCO MODEL 601

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 462 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amp. -Conv.	12DT8	V4	Ratio Det. -AF Amp.	19T8
V2	1st IF Amp.	12BA6	V5	Output	50C5
V3	2nd IF Amp.	12BA6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	150	41-5	AFH2-19	XB0181	FP216	TMD-17	TVL-2442.1	
B	■50	150							
C2	2	50		SRE50V2	NLW2-100	TT150X2	ML2-50	TE-1301	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

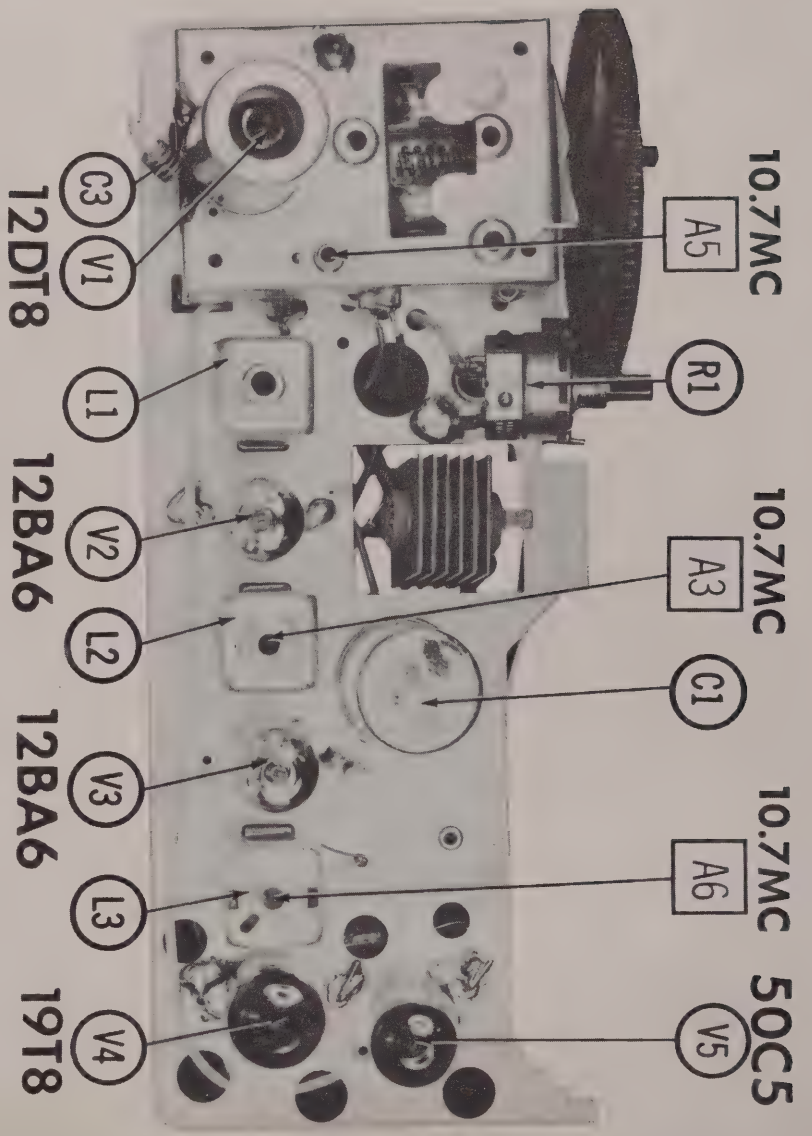
ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	1000				EF-001	MFT-1000			503C-D1	
C4	50				SI 50	D6-500	L10Q5	UC-545	5GA-Q5	
C5	15		N750 5%			DTN-15	C10Q15U	CN7-415	5TCU-Q15S 5%*	
C6	9		N080 5%							
C7	8.5		N080 5%							
C8	68		N750 10%		N750-DI 68	DTN-68	C10Q68U	CN7-468	5TCU-Q68S 10%*	
C9	5		N220 5%							
C10	450									
C11	1000				EF-001	MFT-1000			503C-D1	
C12	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C13	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C14	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C15	6.8		N150 10%							
C16	100		N1500			TCL-100				
C17	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C18	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C19	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C20	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C21	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	1000				EF-001	MFT-1000			503C-D1	
C23	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C24	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C25	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GRANCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	45-18	B-69	A47-1meg-S	Q11-137	U54	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Off-On

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	2200Ω	
R3	48K	
R4	5600Ω	
R5	1meg	
R6	330Ω	
R7	100K	

ITEM No.	RATING	REMARKS
R8	330Ω	
R9	1meg	
R10	47K	
R11	4.7meg	
R12	220K	
R13	470K	

ITEM No.	RATING	REMARKS
R14	160Ω	
R15	900Ω 4W	
R16	22Ω	
R17	470Ω 1W	
R18	100Ω 7W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GRANCO PART No.	REPLACEMENT DATA
K1	Detector Load	1500mmf, 22K		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		GRANCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 L2 L3	Input IF Trans. Output IF Trans. Ratio Detector	28-2 CL473	16-3487 17-3498	16-3487 17-3498	FM-254 FM-255	1463 1465		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	GRANCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	3-4Ω	33-3-1	24S53 ①	A-3025①	AU-605①	A-3332①	24S53①	S-12X ①	① Bend Ears Down

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	GRANCO PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	34-7-1	4A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	GRANCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.031A	①	1235AH ①	T100 ①	100A①		① Selenium Type

CABINETS & CABINET PARTS

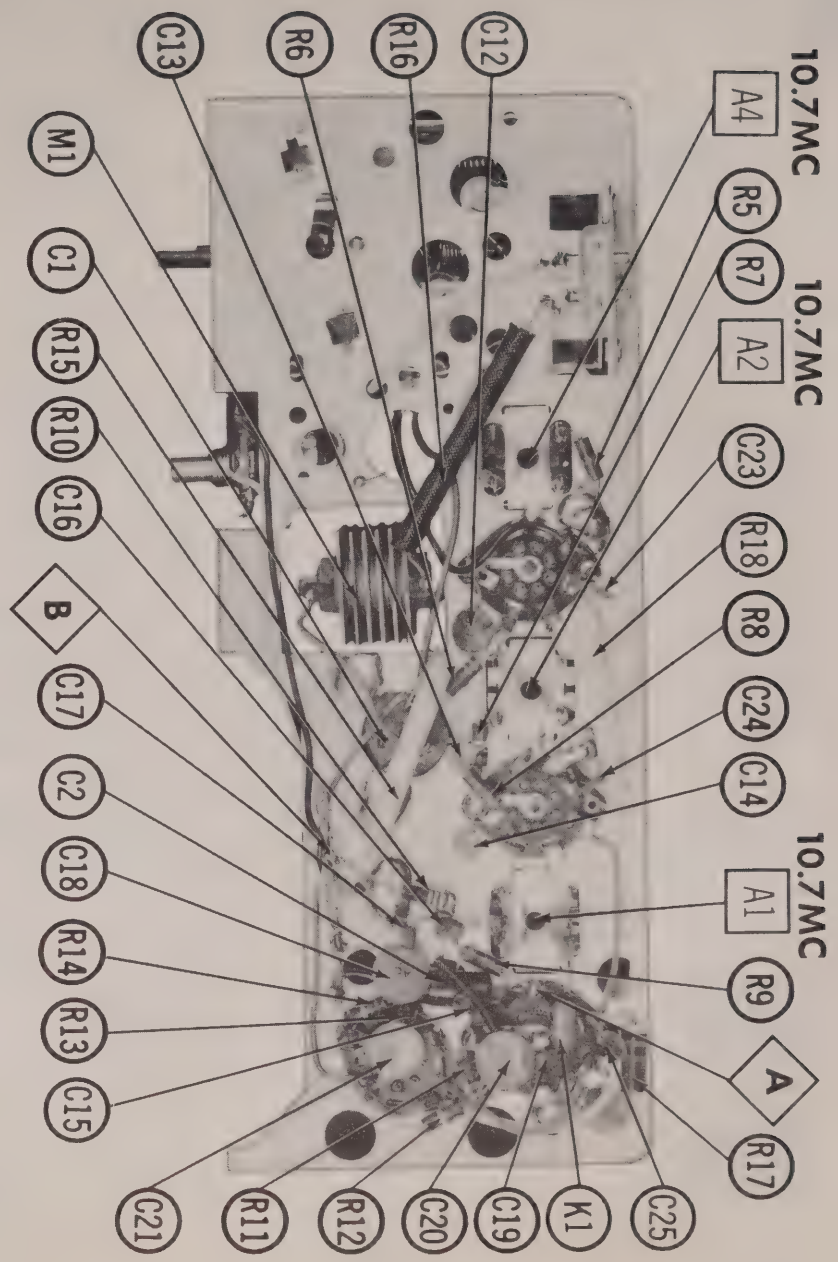
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS BOTTOM VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Remove Hank Antenna.
Suggested Alignment Tools:
A1, A6.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A2, A3, A4.....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A7, A8.....GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (± 1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	50mmf	High side to pin 8 (Cathode) of RF amp. Low side to chassis.	10.7KC (Unmod.)	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	50mmf	High side to pin 8 (Cathode) of RF amp. Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference	Vert. amp to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Disconnect Stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	"	"	"	"	Vert. amp to point Ⓑ. Low side to chassis.	A6	Reconnect C2. Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
3.	50mmf	High side to pin 8 (Cathode) of RF Amp. Low side to chassis.	108MC (Unmod.)	108MC	DC probe to point Ⓐ. Common to chassis.	A7, A8	Adjust for maximum deflection.
4.	"	"	88MC	88MC	"	A9, A10	Adjust for maximum deflection by moving padder flaps (A9 & A10) closer or farther from oscillator and RF coil. Repeat steps 3 and 4 for maximum deflection.

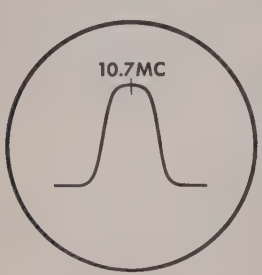


FIG. 1

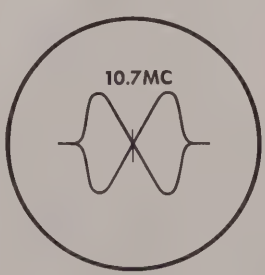
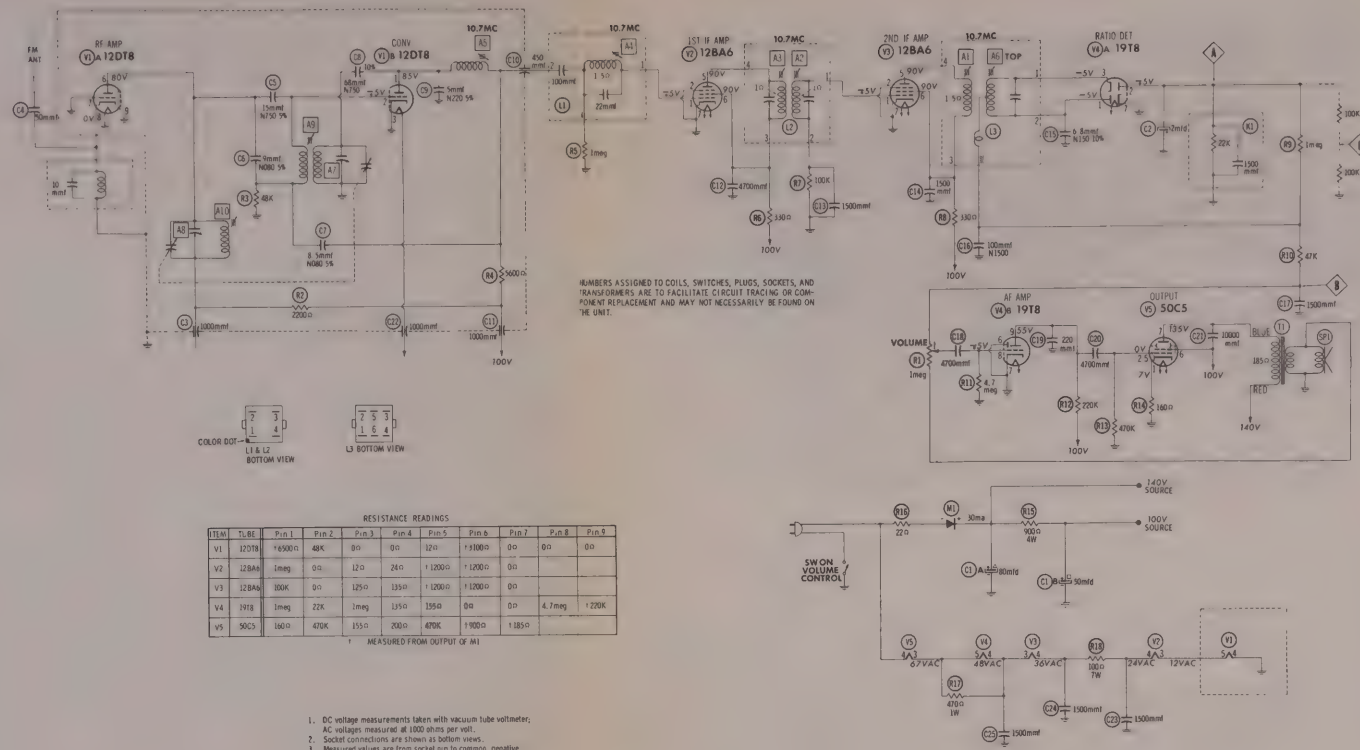


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DT8	†6500Ω	48K	0Ω	0Ω	12Ω	†100Ω	0Ω	0Ω	0Ω
V2	12BA6	1meg	0Ω	12Ω	24Ω	†1200Ω	†1200Ω	0Ω		
V3	12BA6	100K	0Ω	125Ω	135Ω	†1200Ω	†1200Ω	0Ω		
V4	19T8	1meg	22K	2meg	135Ω	155Ω	0Ω	0Ω	4.7meg	†220K
V5	50C5	160Ω	470K	155Ω	200Ω	470K	†900Ω	†185Ω		

† MEASURED FROM OUTPUT OF M1

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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GRANCO MODEL 601

PHOTOFACT* Folder

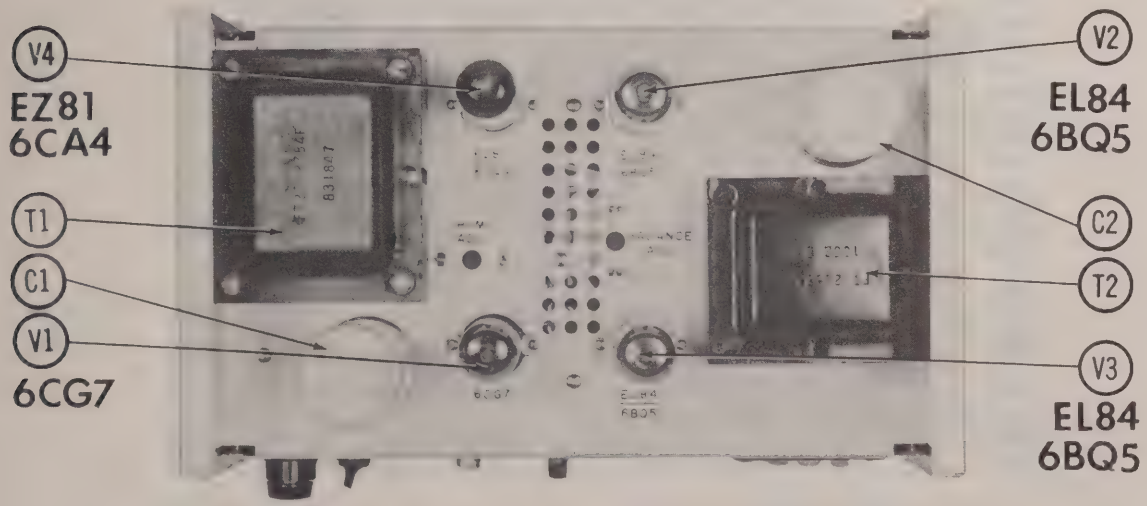
EIA

HARMAN-KARDON
MODEL HK20

HARMAN-KARDON
MODEL HK20

HARMAN-KARDON
MODEL HK20

TRADE NAME	Harman-Kardon Model HK20		
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, Long Island, N. Y.		
TYPE SET	AC Operated 4 Tube Audio Amplifier		
POWER SUPPLY	105-125 Volts AC, 60 Cycles	RATING	70 Watts, .7 Amp. @ 117 Volts AC



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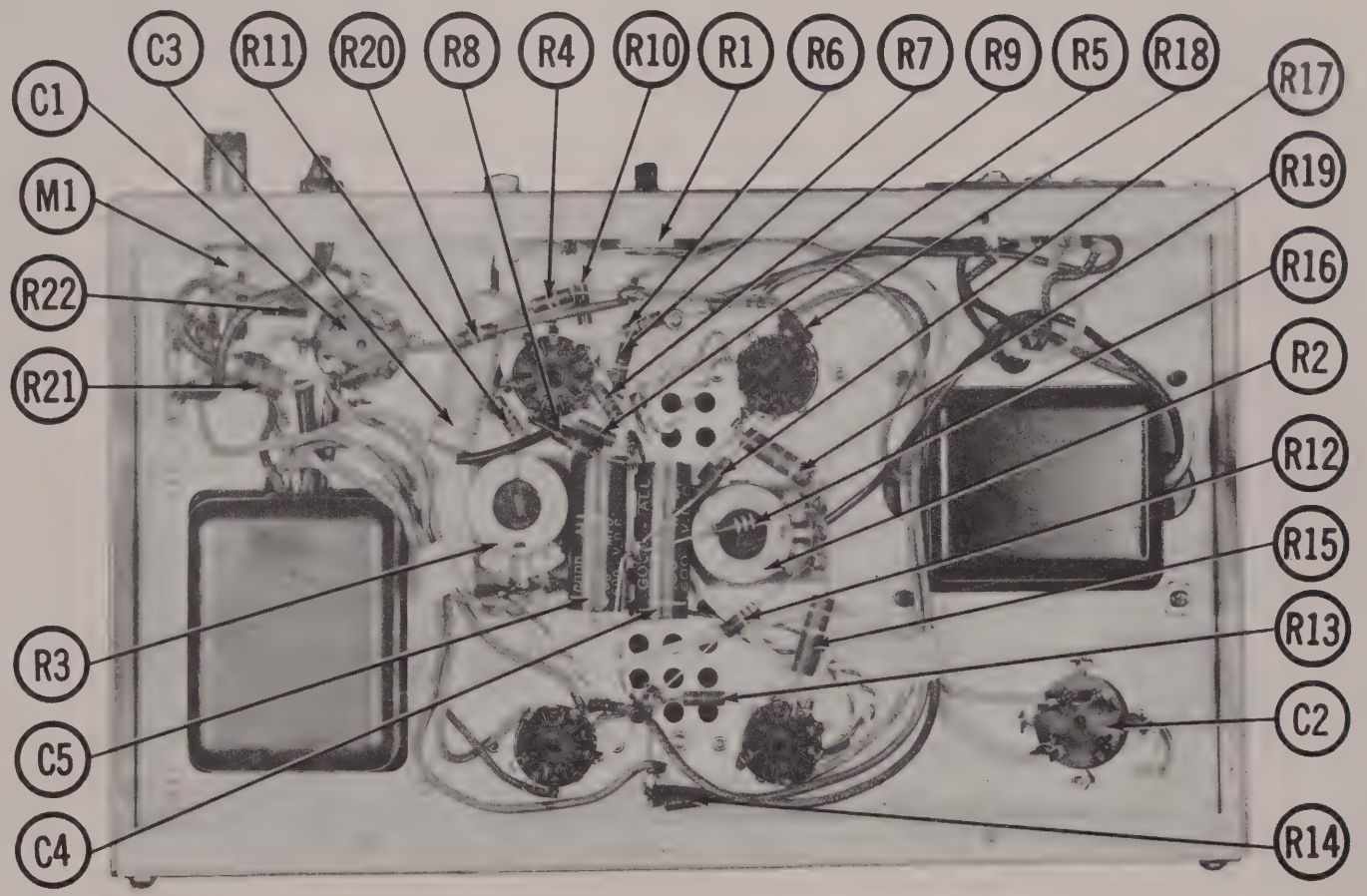


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier - Phase Inv.	6CG7	V3	Output	EL84/6BQ5
V2	Output	EL84/6BQ5	V4	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	JE2202842	AFH2-58	C0355	FP239	TMD-56	TVL-2766	
B	■50	350							
C2A	▲40	300	JE2202974	AFH3-142	C1090	FP375	TMT-141	TVL-3755	
B	40	300							
C	▲100	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C4	.05	600			P688N-05	DF-503	CUB6S5	GEM-615	6TM-S5	
C5	.05	600			P688N-05	DF-503	CUB6S5	GEM-615	6TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K		RV2472952		B47-500K-Z	B13-133	TA55A	Level
B	Shaft				Not Req.	TMI	Not Req.	
R2	100Ω		RVCOM2569					Balance Adjust
R3	100Ω		RVCOM2569					Hum Adjust

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	150K	
R5	1meg	
R6	68K	
R7	22K 5%	
R8	1000Ω	
R9	22K 5%	
R10	1500Ω	

ITEM No.	RATING	REMARKS
R11	220K	
R12	470K	
R13	1000Ω	
R14	220Ω	
R15	270Ω 1W	
R16	470K	
R17	1000Ω	

ITEM No.	RATING	REMARKS
R18	220Ω	
R19	270Ω 1W	
R20	15K	
R21	2200Ω	
R22	39Ω 1W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .70A	640VCT @ .090A	6.3V @ 2.9A	FT2202784						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V Not used									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω CT	16Ω Taps @ 8Ω, 4Ω	FT2202785	22S68 ①			A-3304 ①	22S68 ①	S-31A ①	① Use original shields.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Harman-Kardon PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1½A 250V	ZCOM2953		31201.5 (3AG 1½A 250V)	342001	AGC 1½	HKP

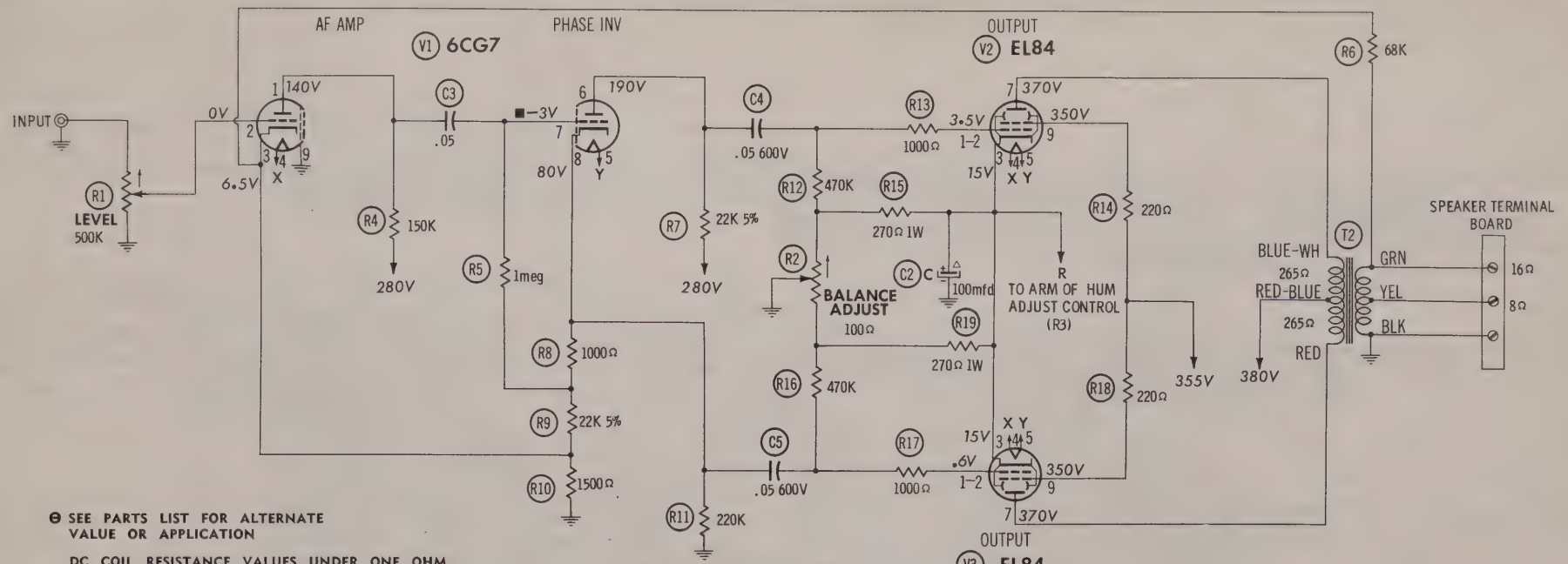
CABINETS & CABINET PARTS

When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

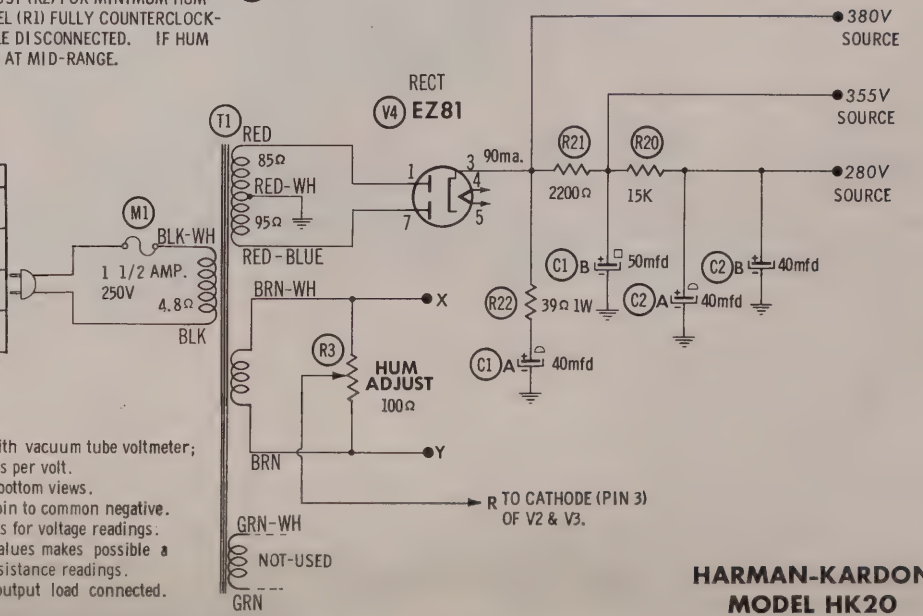
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

ADJUST BALANCE ADJUST (R2) FOR MINIMUM HUM IN SPEAKER WITH LEVEL (R1) FULLY COUNTERCLOCKWISE AND INPUT CABLE DISCONNECTED. IF HUM IS INAUDIBLE, SET R2 AT MID-RANGE.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CG7	†165K	0Ω	1500Ω	200Ω	200Ω	†39K	1meg	24K	0Ω
V2	EL84 6BQ5	470K	470K	170Ω	200Ω	200Ω	NC	†265Ω	NC	†2400Ω
V3	EL84 6BQ5	470K	470K	170Ω	200Ω	200Ω	NC	†265Ω	NC	†2400Ω
V4	EZ81 6CA4	85Ω	NC	¶	200Ω	200Ω	NC	95Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4.
■ MEASURED FROM PIN 8 OF V1. NC NO CONNECTION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HARMAN-KARDON MODEL HK20

PHOTOFACT* Folder

EIA MEMBER

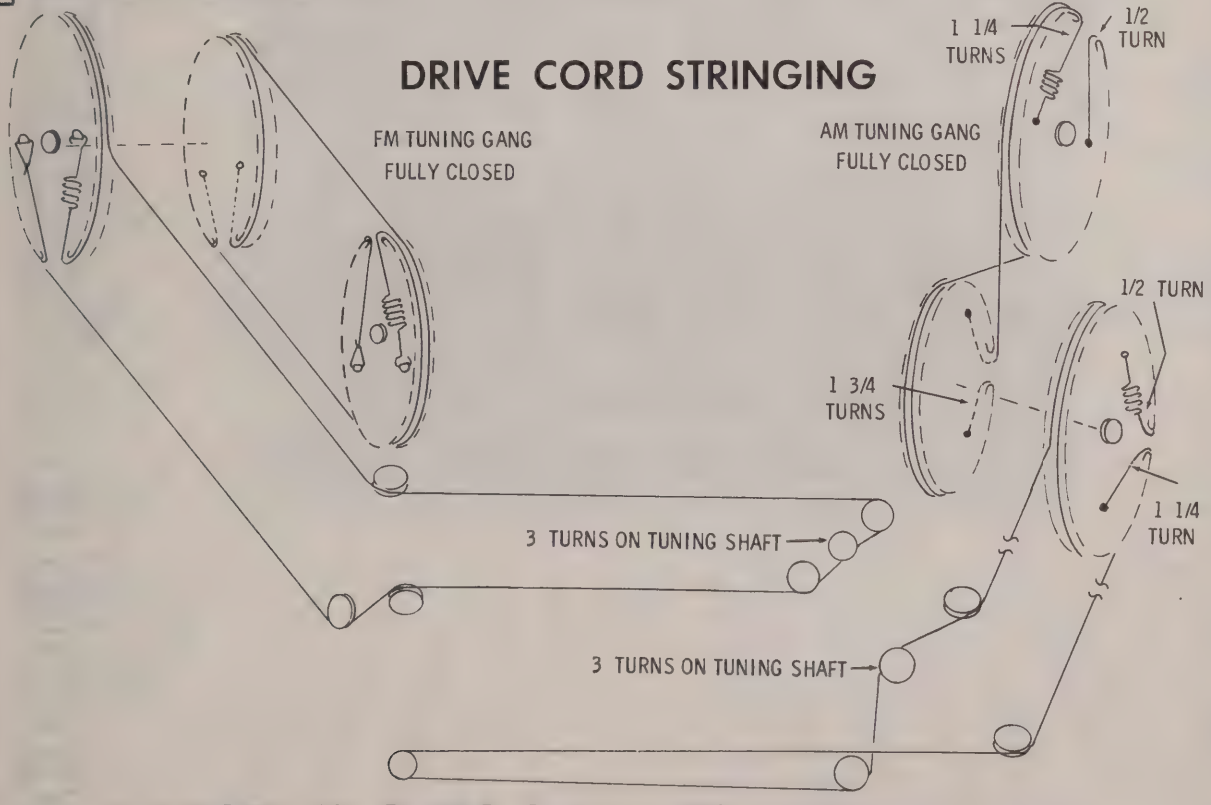
KNIGHT MODEL KN-120 (92SU423)

KNIGHT MODEL
KN-120 (92SU423)

TRADE NAME	Knight Model KN-120 (92SU423)		
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois		
TYPE SET	AC Operated 15 Tube FM-AM Tuner		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	59 Watts, .57 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 - 1640KC	FREQ. MOD.	88 —108MC

KNIGHT MODEL
KN-120 (92SU423)

DRIVE CORD STRINGING

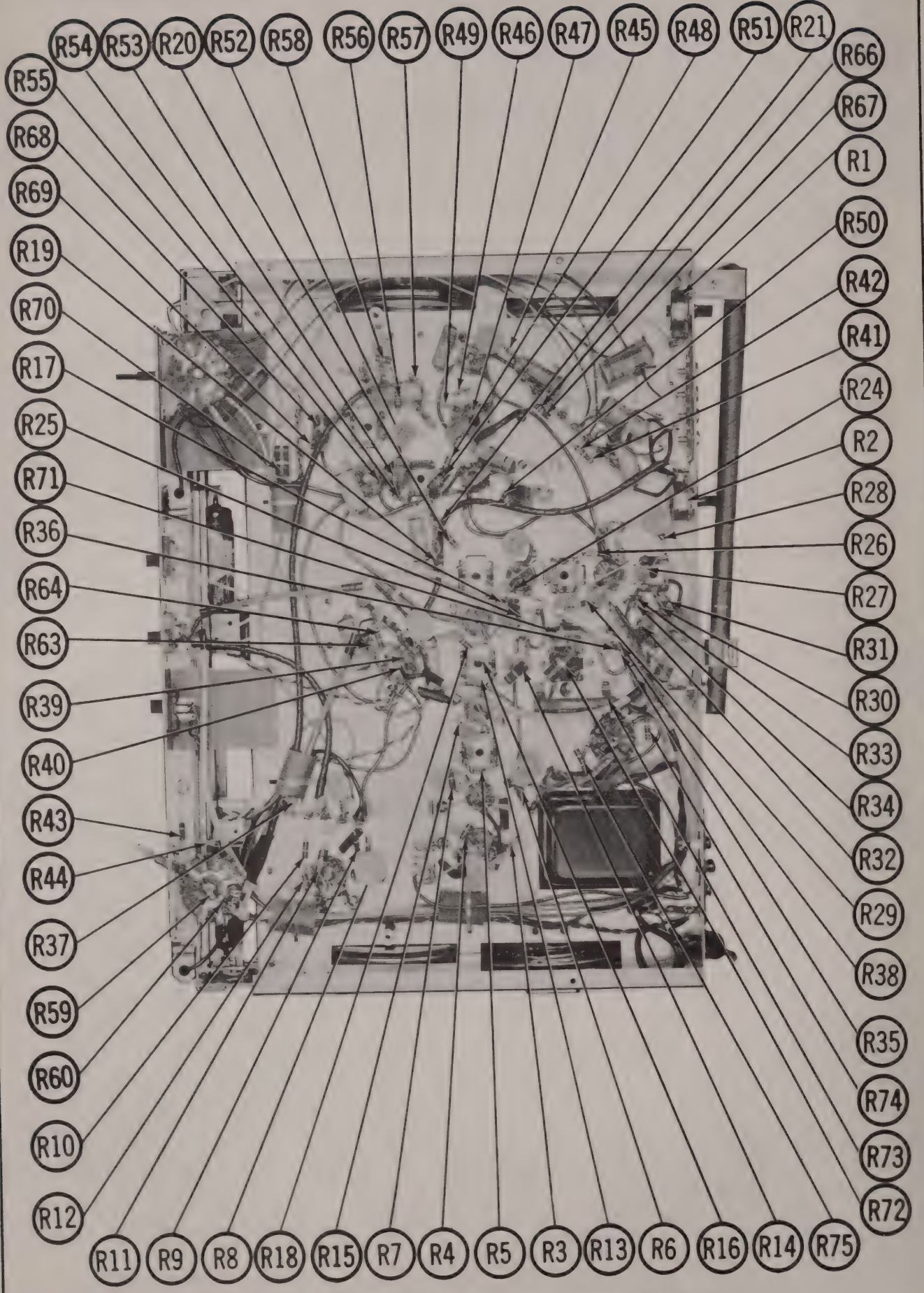


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

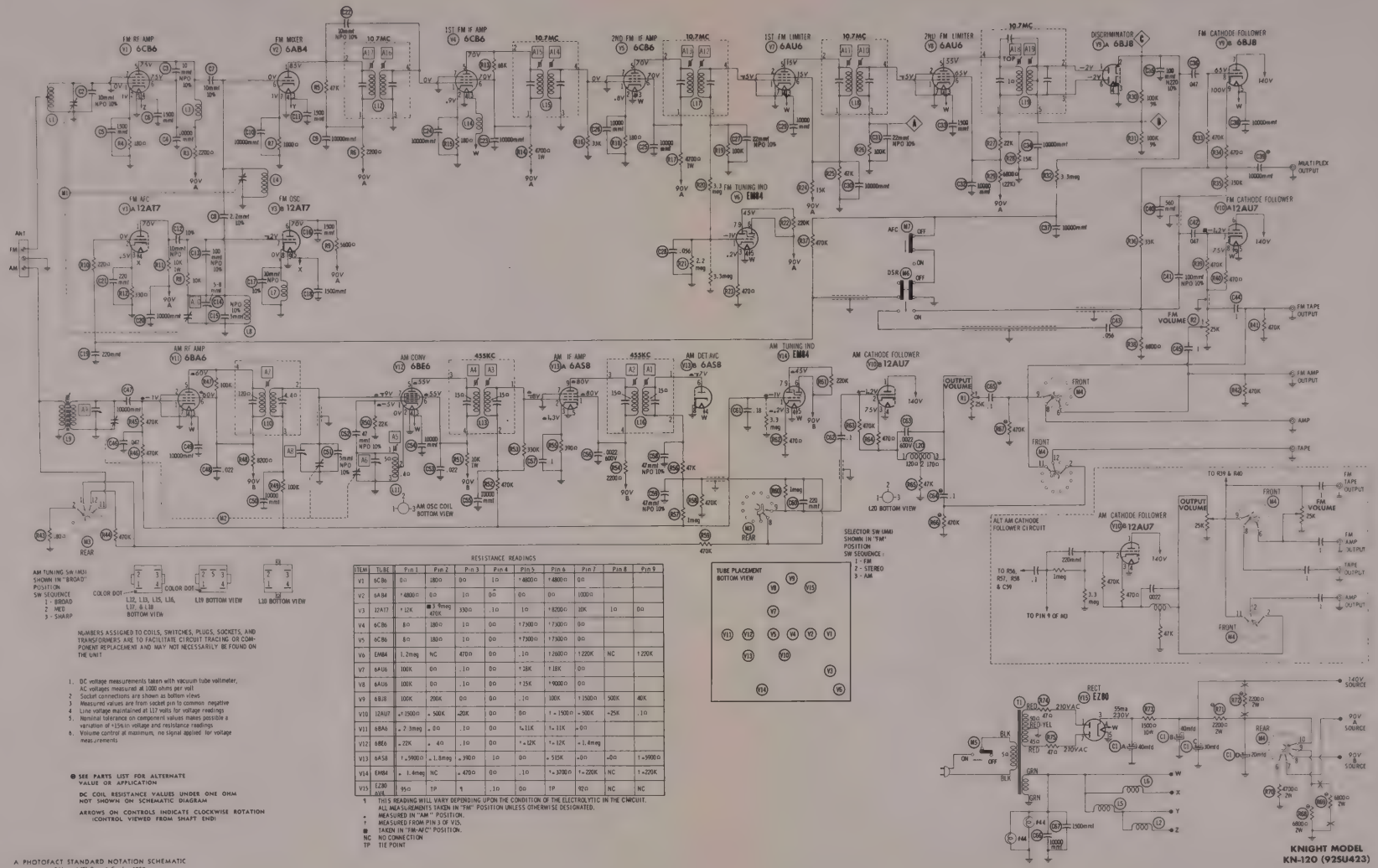
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JL316

SET 462 FOLDER 10



CHASSIS BOTTOM VIEW - RESISTOR IDENT.


FM RF AMP V1 6CB6
FM MIXER V2 6AB4
10.7MC
1ST FM IF AMP V3 6CB6
2ND FM IF AMP V5 6CB6
1ST FM LIMITER V7 6AU6
2ND FM LIMITER V8 6AU6
DISCRIMINATOR V9A 6BJ8
FM CATHODE FOLLOWER V9B 6BJ8
FM AFC V1A 12AT7
FM OSC V3A 12AT7
FM TUNING IND V6 EM84
MULTIPLEX OUTPUT
FM CATHODE FOLLOWER V10A 12AU7
AFC M7 OFF ON
DSR M6 OFF ON
FM VOLUME R2 25K
FM TAPE OUTPUT
ANT FM AM
AM RF AMP V11 6BA6
AM CONV V12 6BE6
455KC
AM IF AMP V13A 6AS8
AM DET AVC V13B 6AS8
AM TUNING IND V14 EM84
AM CATHODE FOLLOWER V10B 12AU7
OUTPUT VOLUME R1 25K
FM AMP OUTPUT
AMP
TAPE
FRONT REAR
AM OSC COIL BOTTOM VIEW
L20 BOTTOM VIEW
SELECTOR SW (M4) SHOWN IN "FM" POSITION SW SEQUENCE: 1 - FM 2 - STEREO 3 - AM
TO R39 & R40
ALT AM CATHODE FOLLOWER CIRCUIT
TO R56, R57, R58 & C59
TO PIN 9 OF M3
AM TUNING SW (M3) SHOWN IN "BROAD" POSITION SW SEQUENCE 1 - BROAD 2 - MED 3 - SHARP
COLOR DOT
L32, L33, L35, L36, L37, & L38 BOTTOM VIEW
L19 BOTTOM VIEW
L30 BOTTOM VIEW
TUBE PLACEMENT BOTTOM VIEW
RECT V15 EZ80
140V SOURCE
90V A SOURCE
90V B SOURCE
KNIGHT MODEL KN-120 (92SU423)

RESISTANCE READINGS

STEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	0Ω	180Ω	0Ω	1Ω	†4800Ω	†4800Ω	0Ω		
V2	6AB4	†4800Ω	0Ω	1Ω	0Ω	0Ω	0Ω	1000Ω		
V3	12AT7	†12K	■ 3.9meg 470K	330Ω	.1Ω	1Ω	†8200Ω	10K	1Ω	0Ω
V4	6CB6	8Ω	180Ω	1Ω	0Ω	†7300Ω	†7300Ω	0Ω		
V5	6CB6	8Ω	180Ω	1Ω	0Ω	†7300Ω	†7300Ω	0Ω		
V6	EM84	1.2meg	NC	470Ω	0Ω	.1Ω	†2600Ω	†220K	NC	†220K
V7	6AU6	100K	0Ω	.1Ω	0Ω	†.18K	†.18K	0Ω		
V8	6AU6	100K	0Ω	.1Ω	0Ω	†15K	†9000Ω	0Ω		
V9	6BJ8	100K	200K	0Ω	0Ω	.1Ω	100K	†1500Ω	500K	40K
V10	12AU7	▲†1500Ω	▲ 500K	-20K	0Ω	0Ω	† = 1500Ω	= 500K	=25K	.1Ω
V11	6BA6	▲ 2.3meg	▲ 0Ω	.1Ω	0Ω	▲.11K	†▲ 11K	▲ 0Ω		
V12	6BE6	▲ 22K	▲ 40	.1Ω	0Ω	†▲ 12K	†▲ 12K	▲ 1.4meg		
V13	6AS8	†▲5900Ω	▲1.8meg	▲ 390Ω	1Ω	0Ω	▲ 515K	▲0Ω	▲0Ω	†▲5900Ω
V14	EM84	▲ 1.4meg	NC	▲ 470Ω	0Ω	.1Ω	†▲ 3700Ω	†▲ 220K	NC	†▲220K
V15	EZ80 AVG	950	TP	¶	.1Ω	0Ω	TP	920	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V15.
■ TAKEN IN "FM-AFC" POSITION.
NC NO CONNECTION
TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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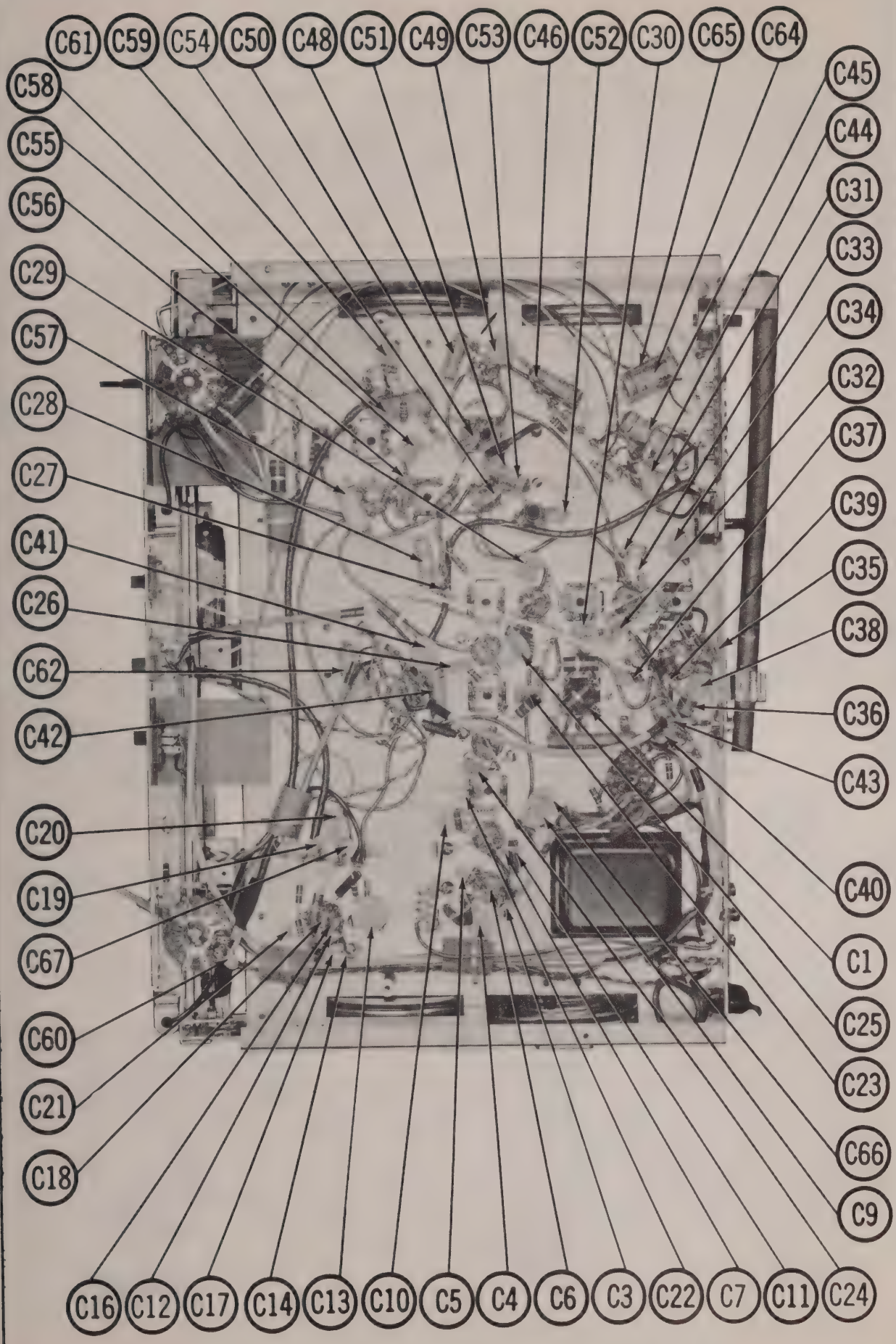


CHASSIS BOTTOM VIEW - CAPACITOR IDENT.

KNIGHT
MODEL KN 120

FOLDER 10

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
- A1 thru A4, A7, A18, A19..... GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545
- A5..... GENERAL CEMENT #8721, 8722 WALSCO #2519
- A6, A8, A9, A20..... GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
- A10 thru A17..... GENERAL CEMENT #5097, 8727 WALSCO #2515

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	AM	Point of non-interference	AC probe to Tape Output jack. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	600KC	"	600KC	"	A5	"
3.	"	"	1400KC	"	1400KC	"	A6	"
4.	"	High side to AM antenna terminal. Low side to chassis.	600KC	"	600KC	"	A7	"
5.	"	"	1400KC	"	1400KC	"	A8, A9	Adjust for maximum deflection. Repeat Step 2 thru 5 until no further improvement is noted.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01mfd	High side to pin 6 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	FM (AFC Off) (DSR Off)	Point of non-interference	DC probe thru 100K to point (A). Common to chassis.	A10, A11, A12, A13, A14, A15, A16, A17	Adjust for maximum output.
7.	"	"	"	"	"	DC probe thru 100K to point (B). Common to chassis.	A18	"
8.	"	"	"	"	"	DC probe thru 100K to point (C). Common to chassis.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01mfd	High side to pin 6 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM (AFC Off) (DSR Off)	Point of non-interference	Vert. amp. thru 100K to point (A). Low side to chassis.	A10, A11, A12, A13, A14, A15, A16, A17	Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
7.	"	"	"	"	"	Vert. amp. thru 100K to point (B). Low side to chassis.	A18	"
8.	"	"	"	"	"	Vert. amp. thru 100K to point (C). Low side to chassis.	A19	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crissover lines.

FM RF ALIGNMENT

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	88MC (Unmod.)	FM (AFC Off) (DSR Off)	88MC	DC probe thru 100K to point (A). Common to chassis.	L8	Adjust for maximum deflection.
10.	"	"	108MC	"	108MC	"	A20	"
11.	"	"	88MC	"	88MC	"	L1, L4	Adjust for maximum deflection. Repeat Steps 9, 10, and 11 until no further improvement is noted.

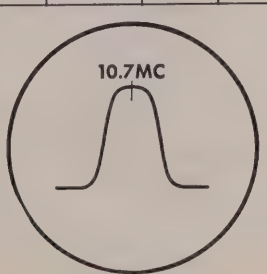


FIG. 1

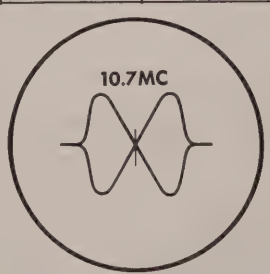
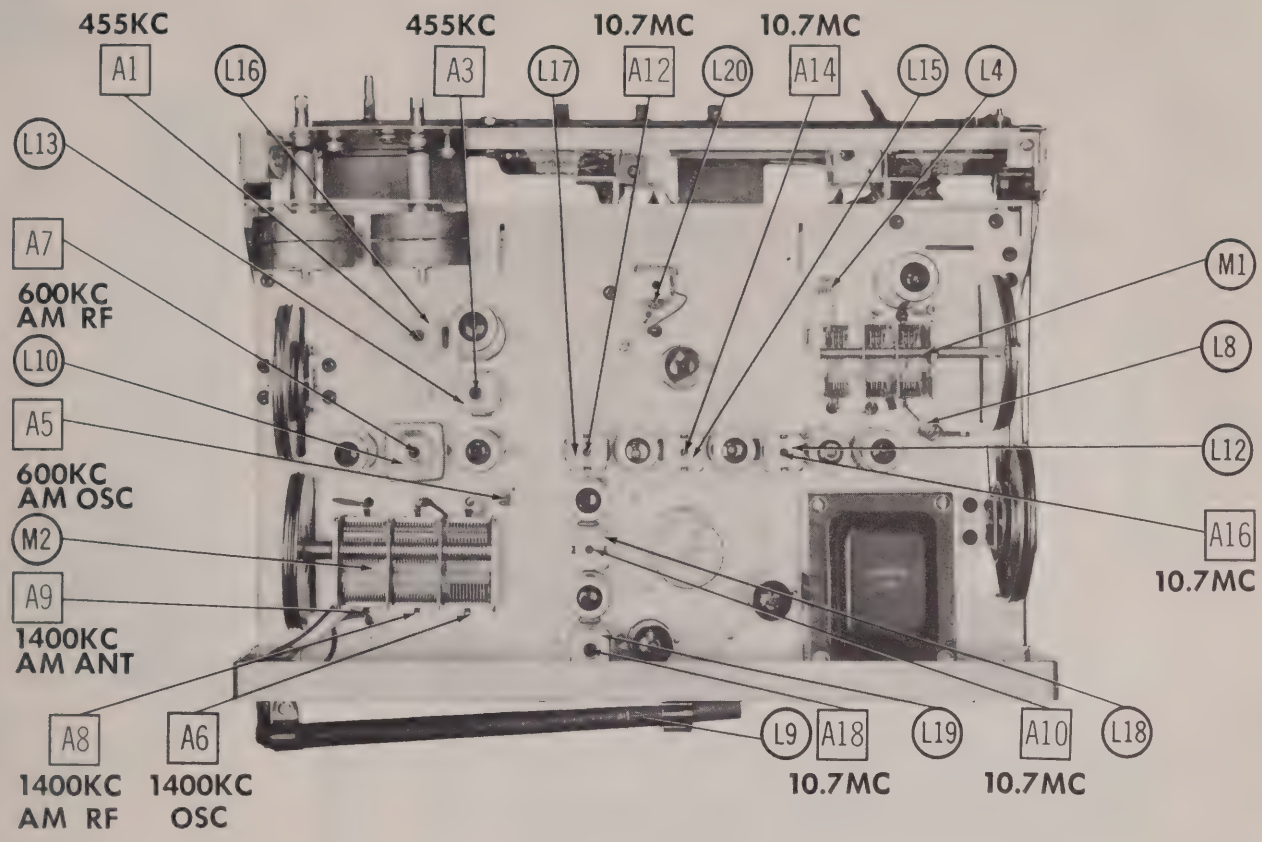
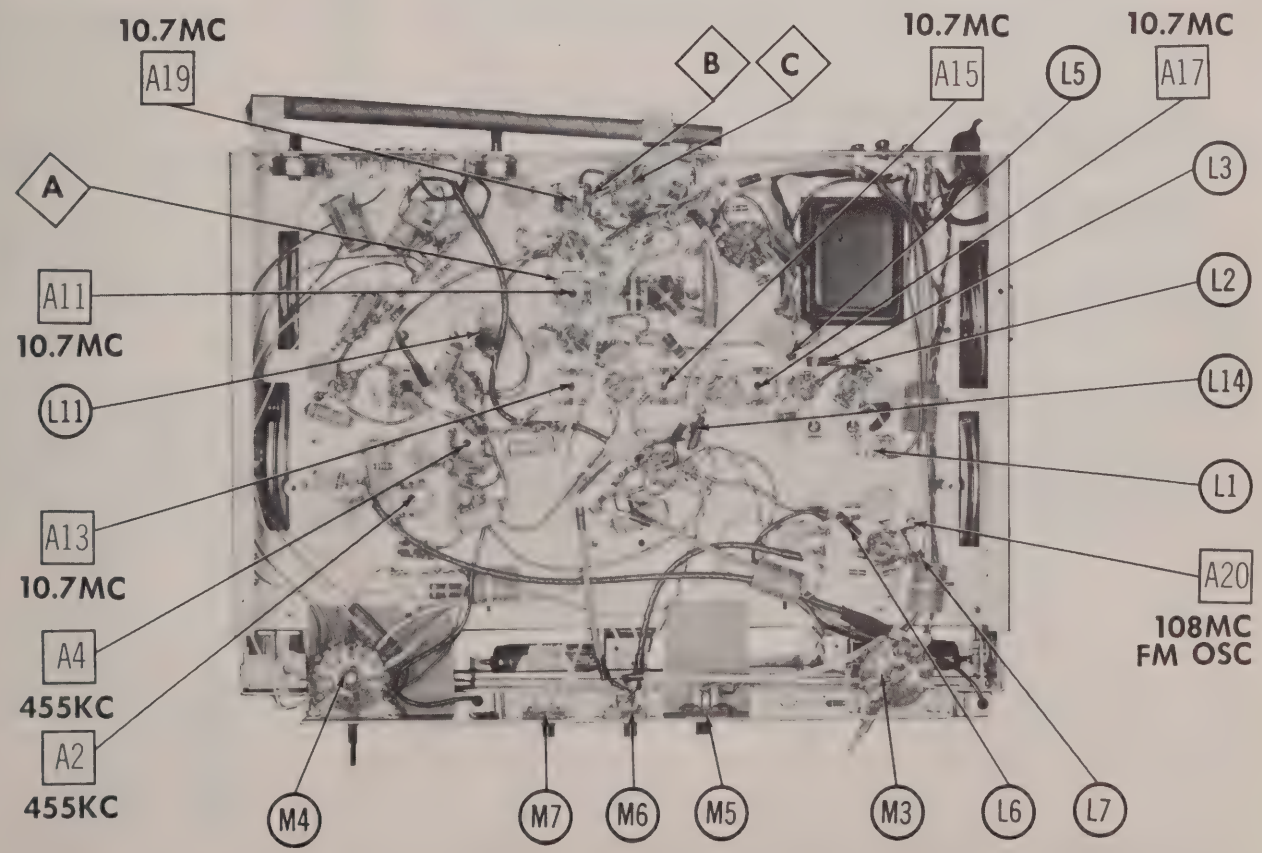


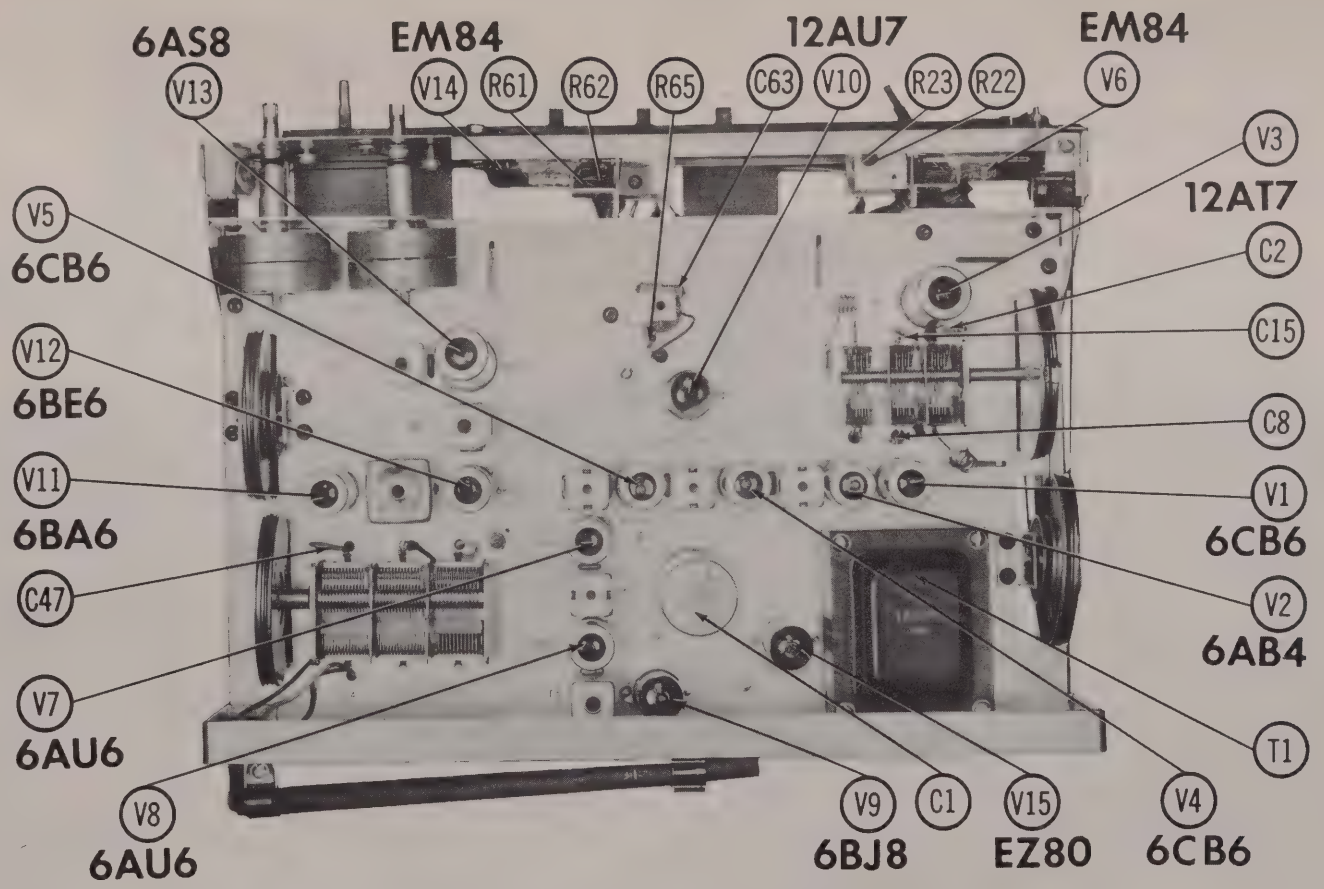
FIG. 2



CHASSIS TOP VIEW - ALIGNMENT, INDUCTOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - ALIGNMENT, INDUCTOR & MISC. IDENT.



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆		
ITEM No.	USE	TYPE
V1	FM RF Amplifier	6CB6
V2	FM Mixer	6AB4
V3	FM Osc. -AFC	12AT7
V4	1st FM IF Amplifier	6CB6
V5	2nd FM IF Amplifier	6CB6
V6	FM Tuning Indicator	EM84
V7	1st FM Limiter	6AU6
V8	2nd FM Limiter	6AU6

ITEM No.	USE	TYPE
V9	Discriminator-FM Cathode Follower	6BJ8
V10	FM Cathode Follower- AM Cathode Follower	12AU7
V11	AM RF Amplifier	6BA6
V12	AM Converter	6BE6
V13	AM IF Amp. -AM Det. -AVC	6AS8
V14	AM Tuning Indicator	EM84
V15	Rectifier	EZ80

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	CE137B	AFH4-02-10	D0022	FP419.5	TMT-23 TD-20-250	TVL-4580	
B	■40	300							
C	▲30	250							
D	20	200							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10		NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CNO-410	MS-41	
C3	10		NPO 10%		NPO-SI 10	TCZ-10	C10Q1C	ZT-541	MS-41	
C4	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C5	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C6	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C7	10		10%		NPO-SI 10	TCZ-10	C10Q1C	ZT-541	MS-41	
C8	2.2		10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22S 10%*	
C9	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C12	10		NPO 10%		NPO-SI 10	TCZ-10	C10Q1C	ZT-541	MS-41	
C13	100		NPO 10%		NPO-DI 100	DTZ-100	C10T1C	CNO-310	MS-31	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	2200Ω	
R4	180Ω	
R5	47K	
R6	2200Ω	
R7	1000Ω	
R8	10K	
R9	5600Ω	
R10	220Ω	
R11	10K 1W	
R12	330Ω	
R13	68K	
R14	4700Ω 1W	
R15	180Ω	
R16	33K	
R17	4700Ω 1W	
R18	180Ω	
R19	100K	
R20	3.3meg	
R21	2.2meg	
R22	220K	
R23	470Ω	
R24	15K	
R25	47K	
R26	100K	
R27	22K	

ITEM No.	RATING	REMARKS
R28	15K	
R29	6800Ω	(22K) *
R30	100K 5%	
R31	100K 5%	
R32	3.3meg	
R33	470K	
R34	470Ω	
R35	150K	
R36	33K	
R37	470K	
R38	6800Ω	
R39	470K	
R40	470Ω	
R41	470K	
R42	470K	
R43	180Ω	
R44	470K	
R45	470K	
R46	470K	
R47	100K	
R48	8200Ω	
R49	100K	
R50	22K	
R51	10K 1W	
R52	470K	

ITEM No.	RATING	REMARKS
R53	330K	
R54	2200Ω	
R55	390Ω	
R56	47K	
R57	1meg	
R58	470K	
R59	470K	
R60	1meg	
R61	220K	
R62	470Ω	
R63	470K	
R64	470Ω	
R65	47K	
R66	470K	Note 1
R67	470K	Note 1
R68	6800Ω 2W	Note 2
R69	6800Ω 2W	Note 2
R70	4700Ω 2W	
R71	2200Ω 2W	Note 3
R72	2200Ω 2W	Note 3
R73	1500Ω 10W	
R74	47Ω	
R75	47Ω	

* Alternate

Note 1. Not used in some versions.

Note 2. Some versions may replace R68 & R69 with a single 34K resistor.

Note 3. Some versions may replace R71 & R72 with a single 1100Ω resistor.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .57A	420 VCT @ .055A	6.3V @ 5.4A	LP-0279						

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C14	.5-8									
C15	5		NPO 10%		NPO-DI 5	DTZ-4R7	C10V5C	ZT-555	MS-55	
C16	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C17	10		NPO 10%		NPO-SI 10	TCZ-10	C10Q1C	ZT-541	MS-41	
C18	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C19	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C20	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C22	10		NPO 10%		NPO-SI 10	TCZ-10	C10Q1C	ZT-541	MS-41	
C23	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C25	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C27	22		NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CNO-422	MS-422	
C28	.056	200			P288N-06		CUB6S6	GEM-6156	6TM-S6	
C29	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C30	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	22		NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CNO-422	MS-422	
C32	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	100		N220 10%							
C36	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C37	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C38	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	①
C40	560				DI-560	DD-561	L10T56	B-356	5GA-T56	
C41	100		NPO 10%		NPO-DI 100	DTZ-100	C10T1C	CNO-310	MS-31	
C42	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C43	.056	200			P288N-06		CUB6S6	GEM-6156	6TM-S6	
C44	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C45	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C46	.047	200			P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C47	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C48	.022	200			P288N-022		CUB2S22	GEM-4122	2TM-S22	
C49	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C50	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C51	5		NPO 10%		NPO-DI 5	DTZ-4R7	C10V5C	ZT-555	MS-55	
C52	47		NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CNO-447	MS-447	
C53	.022	200			P288N-022		CUB2S22	GEM-4122	2TM-S22	
C54	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C55	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C56	.0022	600			P688N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C57	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C58	47		NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CNO-447	MS-447	
C59	47		NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CNO-447	MS-447	
C60	220				BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C61	.18	200			P288N-2		CUB6P2	GEM-402	4TM-P2	
C62	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C63	.0022	600			P688N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C64	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	②
C65	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	②
C66	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C67	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	

① Some versions may use .056mfd@200V in this application.
② Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	25K	½	RP253B		B47-25K-S	B13-120	TA253L	Output Volume
B	Shaft				Not Req.	TM2	Not Req.	
R2A	25K	½	RP253B		B47-25K-S	B13-120	TA253L	FM Volume
B	Shaft				Not Req.	TM2	Not Req.	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		KNIGHT PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil							
L2	Fil. Choke		19-2006	19-2006	BC-560	4590		.68uh
L3	RF Choke							3.3uh
L4	FM RF Coil							
L5	Fil. Choke		19-2006	19-2006	BC-560	4590		.68uh
L6	Fil. Choke		19-2006	19-2006	BC-560	4590		.68uh
L7	Cathode Choke		19-2006	19-2006	BC-560	4590		.68uh
L8	FM Osc. Coil							
L9	Loopstick	LV-0017						
L10	AM RF Coil	LW-0125						
L11	AM Osc. Coil	LL-0059	70-OSC *		BC-393 *			
L12	1st FM IF Trans.	LR-0032	16-3487	16-3487	FM-254	1463		
L13	1st AM IF Trans.	LR-0041	16-6770	16-6770	BC-352	12-C1	RF-1	
L14	Fil. Choke		19-2006	19-2006	BC-560	4590		.68uh
L15	2nd FM IF Trans.	LR-0043	16-3487	16-3487	FM-254	1463		
L16	2nd AM IF Trans.	LR-0041	16-6770	16-6770	BC-353	12-C2	RF-2	
L17	3rd FM IF Trans.	LR-0043	16-3487	16-3487	FM-254	1463		
L18	4th FM IF Trans.	LR-0043	16-3487	16-3487	FM-254	1463		
L19	Discriminator	LQ-0181	17-3494	17-3494	FM-253	1464		
L20	10KC Filter	LC-0240						

* Disregard Pri Winding

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Tuning Cap	CV-450C	FM, 3 Gang
M2	Tuning Cap	CV-981	AM, 3 Gang (Ant. 12—432mmf, RF 12—432mmf, Osc. 8—152mmf)
M3	Switch	X-0366	AM Tuning (Sharp-Med. -Broad)
M4	Switch	X-0366	Function (AM-Stereo-FM)
M5	Switch		Power Off-On (SPDT) Slide Type
M6	Switch		D.S.R. (DPDT) Slide Type
M7	Switch		AFC (SPDT) Slide Type

WIRING DATA

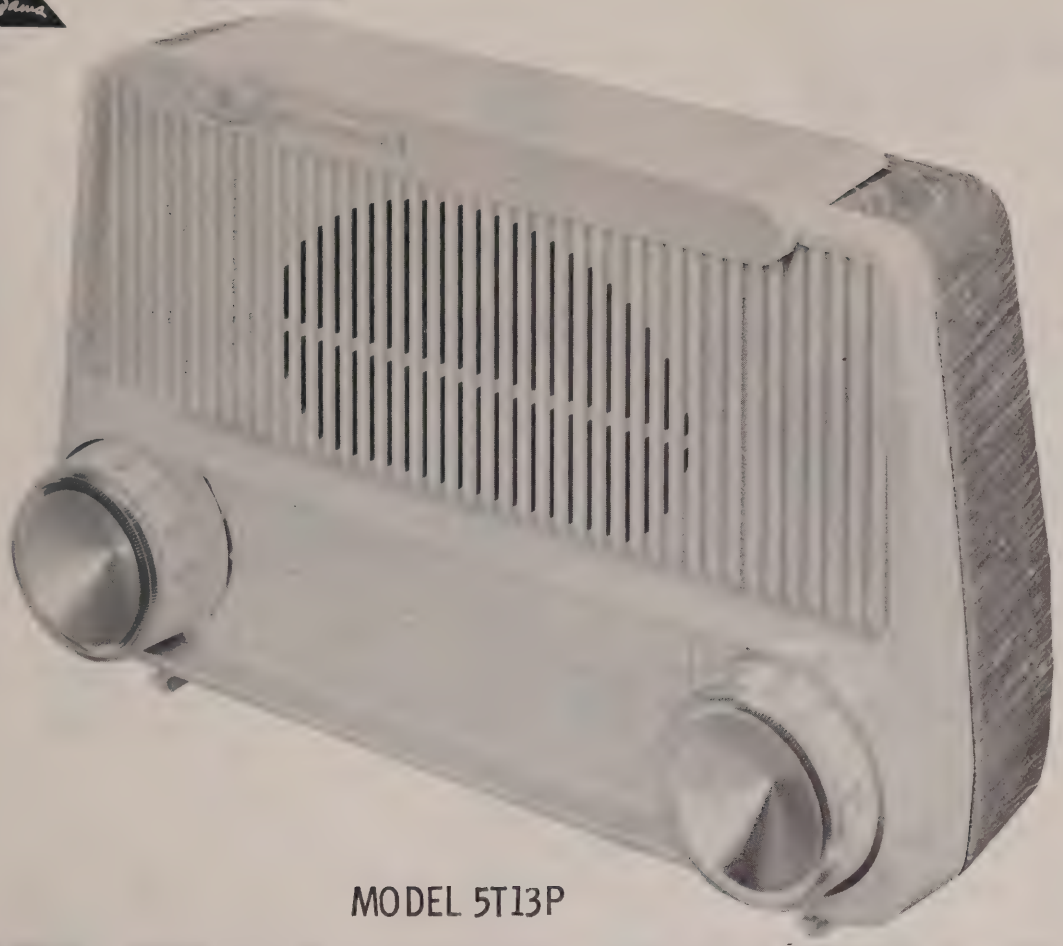
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder with CIRCUITRACE*

MOTOROLA MODELS 5T12B, M, P, W, 5T13P, S, 5T14GW, W (Ch. HS-653, HS-654)

MOTOROLA MODELS 5T12B, M, P, W, 5T13P, S, 5T14GW, W (Ch. HS-653, HS-654)



MODEL 5T13P

MOTOROLA MODELS 5T12B, M, P, W, 5T13P, S, 5T14GW, W (Ch. HS-653, HS-654)

TRADE NAME	Motorola Models 5T12B. M. P. W (HS-653); 5T13P. S; 5T14GW. 5T14W (Ch. HS-654)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC-DC Operated 5 Tube AM Receiver
POWER SUPPLY	110-120 Volts AC-DC
RATING	27 Watts, .25 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A4 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of converter. Low side to B-.	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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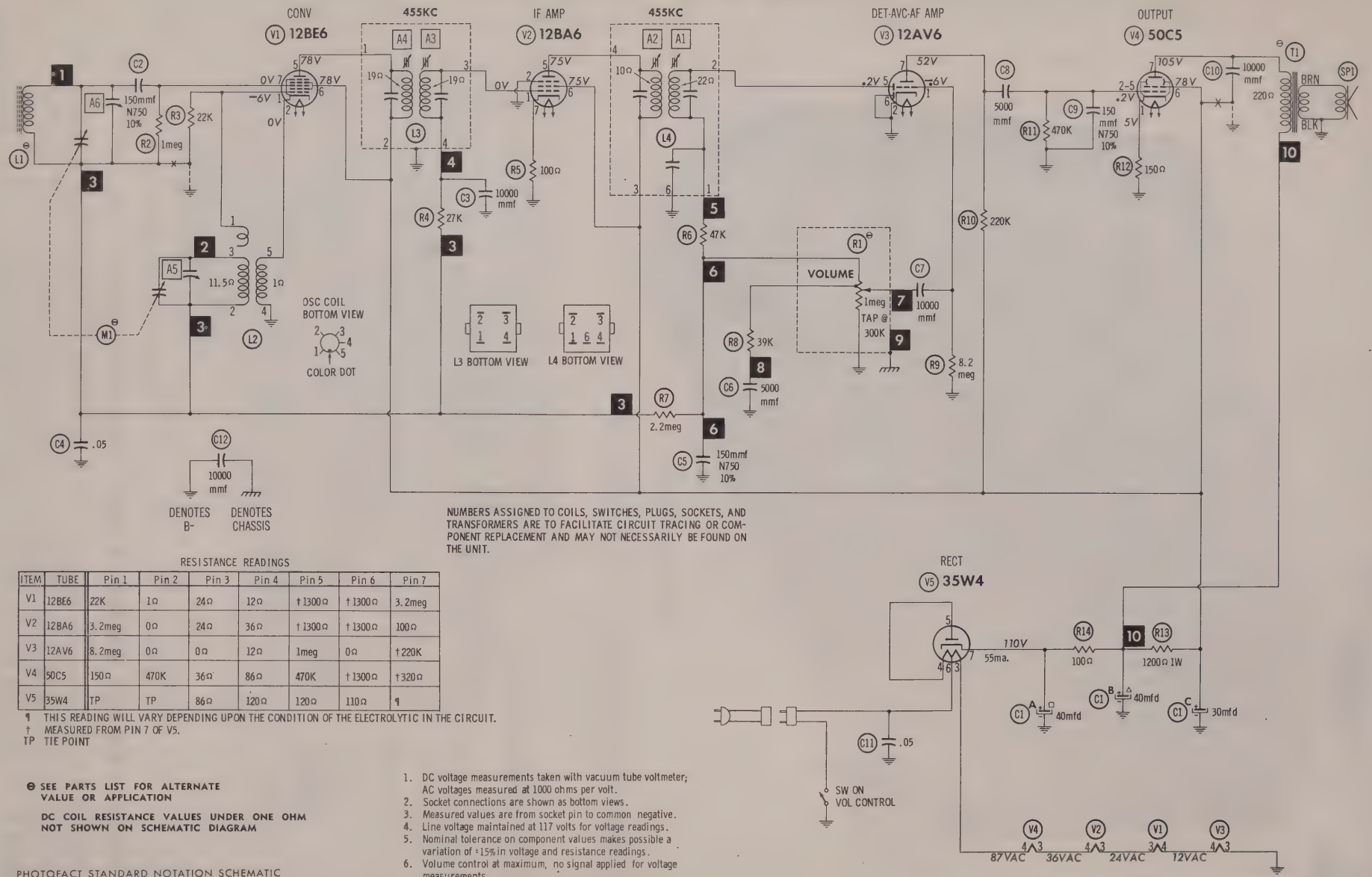
JG242



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1Ω	24Ω	12Ω	†1300Ω	†1300Ω	3.2meg
V2	12BA6	3.2meg	0Ω	24Ω	36Ω	†1300Ω	†1300Ω	100Ω
V3	12AV6	8.2meg	0Ω	0Ω	12Ω	1meg	0Ω	†220K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1300Ω	†320Ω
V5	35W4	TP	TP	86Ω	120Ω	120Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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MOTOROLA MODELS 5T12B, M, P, W, 5T13P, S, 5T14GW, W (Ch. HS-653, HS-654)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	IF Amplifier	12BA6	V5	Rectifier	35W4
V3	Det.-AVC-AF Amp.	12AV6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	150	23B639496	AFH3-11-30	C0090 †	PFP311.63		PCLS-3439.1*	
B	▲40	150							
C	30	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use printed circuit adaptors #55277 and 55278.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	150		N750 10%	21K127652	N750-DI 150	DTN-150	C10T15U	CN7-315	5TCU-T15	
C3	10000			21R128284	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C4	.05	400		8K121268	P485N-05	DF-503	WMF4S47E	GTM-415	4EP-S50	
C5	150		N750 10%	21K127652	N750-DI 150	DTN-150	C10T15U	CN7-315	5TCU-T15	
C6	5000			21K633232	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C7	10000			21K128284	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	5000			21K633232	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C9	150		N750 10%	21K127652	N750-DI 150	DTN-150	C10T15U	CN7-315	5TCU-T15	
C10	10000			21K533472	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	.05	400		8K121268	P485N-05	DF-503	WMF4S47E	GTM-415	4EP-S50	
C12	10000			21R128284	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	18B640959 ①					Loudness, Tap @ 300K
B	Switch							Push-Pull, Off-On

① 5T12 Series use Part #18B640762.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1meg	
R3	22K	
R4	27K	
R5	100Ω	
R6	47K	

ITEM No.	RATING	REMARKS
R7	2.2meg	
R8	39K	
R9	8.2meg	
R10	220K	
R11	470K	

ITEM No.	RATING	REMARKS
R12	150Ω	
R13	1200Ω 1W	
R14	100Ω	

COILS (RF-IF)

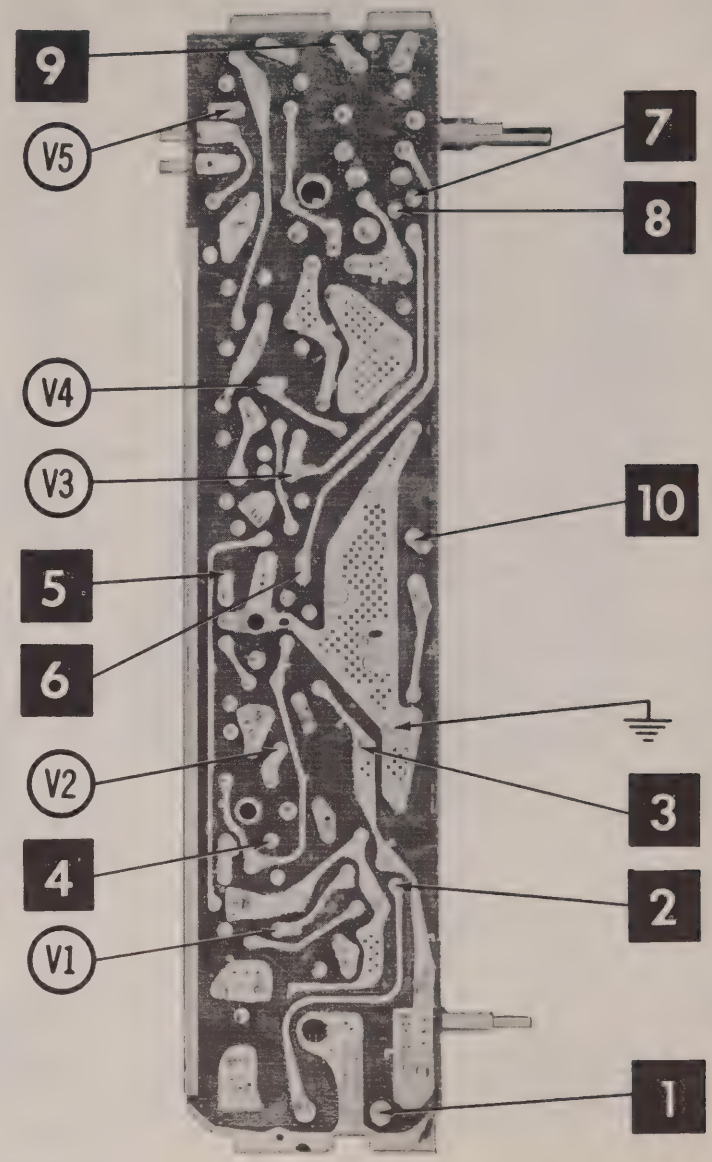
ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	1V641198						Note 1
L2	Osc. Coil	24B637228						
L3	Input IF	24K636016	16-6780	16-6780	BC-356	13-PC9	RF-4	
L4	Output IF	24K639362	16-6781	16-6781		13-PC6		

Note 1. 5T12 Series use Part #1V641116 in this application.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2900Ω	3-4Ω	25C640766 ①	22S46 ③	A-2928 ③	AU-603 ③	A-3876 ③	22S46 ③	S-16X ③	① Used in 5T13 & 5T14 Series. ② Alt. Part No. for 5T13 & 5T14 Series, Part #25B640763 used in 5T12 Series. ③ Use original frame.
	3300Ω	3-4Ω	25K640899 ②	22S46 ③	A-3031 ③	AU-603 ③	A-3876 ③	22S46 ③	S-16X ③	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4" x 6"	PM	3-4Ω	50K640832 ①	46A15	① Models 5T13P, S; 5T14GW, W
	4"	PM	3-4Ω	50K640764 ②		② Models 5T12B, M, P, W

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuning Cap.	19K640993	2 Gang, Models 5T13P, S; 5T14GW, W
	Tuning Cap.	19B640822	2 Gang, Models 5T12B, M, P, W
	Printed Board	84K643249	Replacement for #84C640824 and #84K643199. When replacing solder support bracket to edge plating near tuning gang and CircuiTrace point 9.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

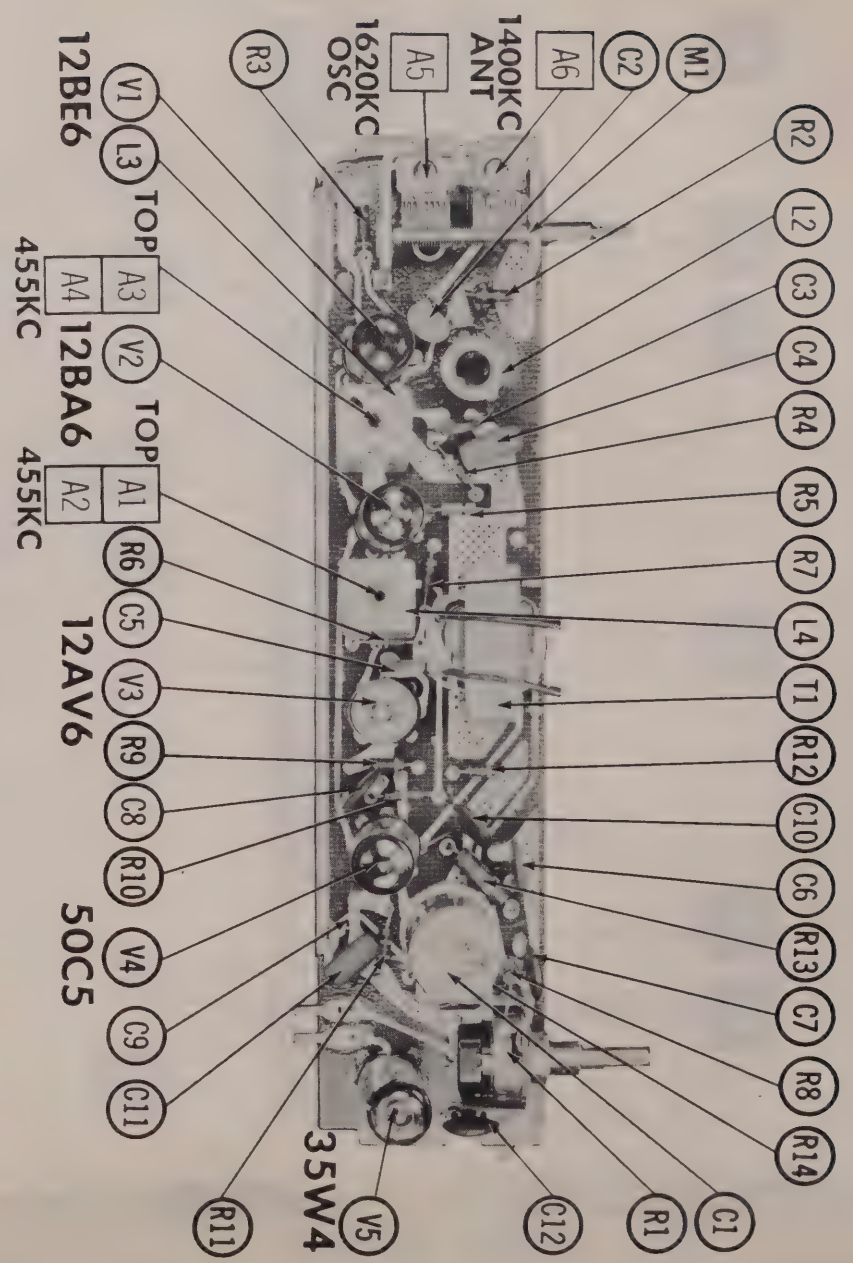
NAME	PART NO.	DESCRIPTION
Knob	36K640997	Tuning, Models 5T12B, M, P, W
Knob	36K641021	Tuning, Models 5T13P, S
Knob	36C641020	Tuning, Models 5T14W, GW
Knob	36D640996	Loudness, On-Off, Models 5T12B, M, P, W
Knob	36K641023	Loudness, On-Off, Models 5T13P, S
Knob	36C641022	Loudness, On-Off, Models 5T14W, GW
Knob	36C641024	Loudness Indicator, Models 5T13P, 5T14W
Knob	36K641025	Loudness Indicator, Model 5T13S
Knob	36K641026	Loudness Indicator, Model 5T14GW
Knob	36C641061	Dial Scale, Models 5T13P, 5T14W
Knob	36K641062	Dial Scale, Model 5T13S
Knob	36K641063	Dial Scale, Model 5T14GW
Cabinet Front	1V641118	Blue, Model 5T12B
Cabinet Front	1V641119	Mahogany, Model 5T12M
Cabinet Front	1V641120	Pink, Model 5T12P
Cabinet Front	1V641121	Antique White, Model 5T12W
Cabinet Front	1V641196	Pink, Model 5T13P
Cabinet Front	1V641197	Maple Sugar, Model 5T13S
Cabinet Front	1V641311	Green, Model 5T14GW
Cabinet Front	1V641312	Antique White, Model 5T14W
Cabinet Rear	16K641006	Antique White, Model 5T12B
Cabinet Rear	16D641004	Mahogany, Model 5T12M
Cabinet Rear	16K641005	Gray, Models 5T12P, 5T12W
Cabinet Rear	16K641007	Metallic Wood, Model 5T13P
Cabinet Rear	16K641008	Black & Gold, Model 5T13S
Cabinet Rear	16K641009	Antique White, Models 5T14W, GW

WIRING DATA

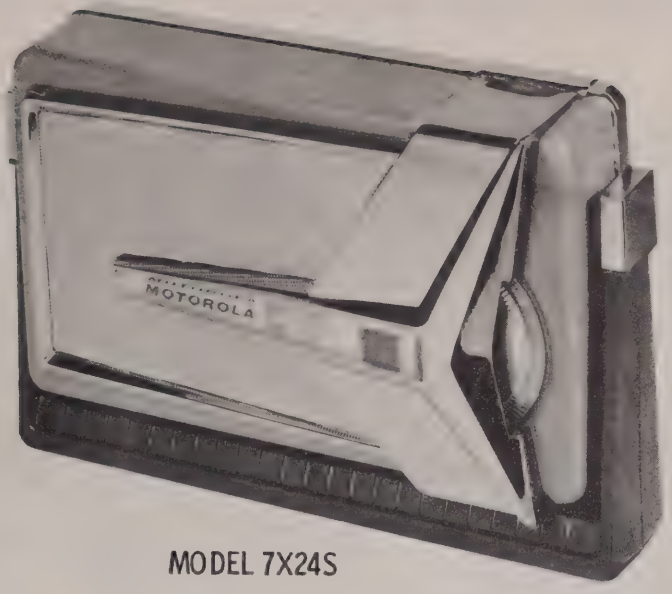
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT* Folder with CIRCUITRACE*



MODEL 7X24S

TRADE NAME	Motorola Models 7X23E, 7X24S, 7X24W (Ch. HS-688)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	6 Volts DC
RATING	9MA @ 6 Volts DC (No Signal, Min Volume)
TUNING RANGE—BROADCAST	535KC - 1620KC
	14MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A6, A7 ..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A4, A5 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna lug of tuning gang. Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A5	"
	It is not necessary to perform steps 4, 5 and 6 unless the oscillator core has been tampered with or associated components have been replaced. Before proceeding, set oscillator trimmer (A4) 1/4 turn from tight.						
4.		Loop	600KC	600KC	Across voice coil	A6	Adjust for maximum output while rocking tuning gang.
5.		"	1620KC	Tuning gang fully open	"	A4	Adjust for maximum output. Repeat steps 4 and 5 until oscillator covers required range.
6.		"	1400KC	1400KC	"	A5	Adjust for maximum output.
7.		"	1400KC	1400KC	"	A7	Adjust for maximum output. If oscillations occur, adjust A7 clockwise until oscillations cease.

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JF 262

MOTOROLA MODELS 7X23E,
7X24S, W (Ch. HS-688)

MOTOROLA MODELS 7X23E,
7X24S, W (Ch. HS-688)

SET 462 FOLDER 12

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	RF Amplifier				2N168A	NPN
X2	2N168A	Converter				2N168A	NPN
X3	2N293	1st IF Amplifier				2N216	NPN
X4	2N293	2nd IF Amplifier				2N216	NPN
X5	2N265	Driver				2N406	PNP
X6	2N241	Output				2N241A	PNP } Matched
X7	2N241	Output				2N241A	PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	50	10	23K640702	XPP-10050	ECPB215		ML50-15	VL-1134	
C2	25	3	23K637758	XPP-3025	NLW25-3	TT3X25	ML25-3	TE-1055	
C3	6	10	23K636769	XPP-10006	NLW6-25	TT12X5	ML6-15	TE-1127.1	
C4	50	10	23K640702	XPP-10050	ECPB215	PET1575	ML50-15	VL-1134	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

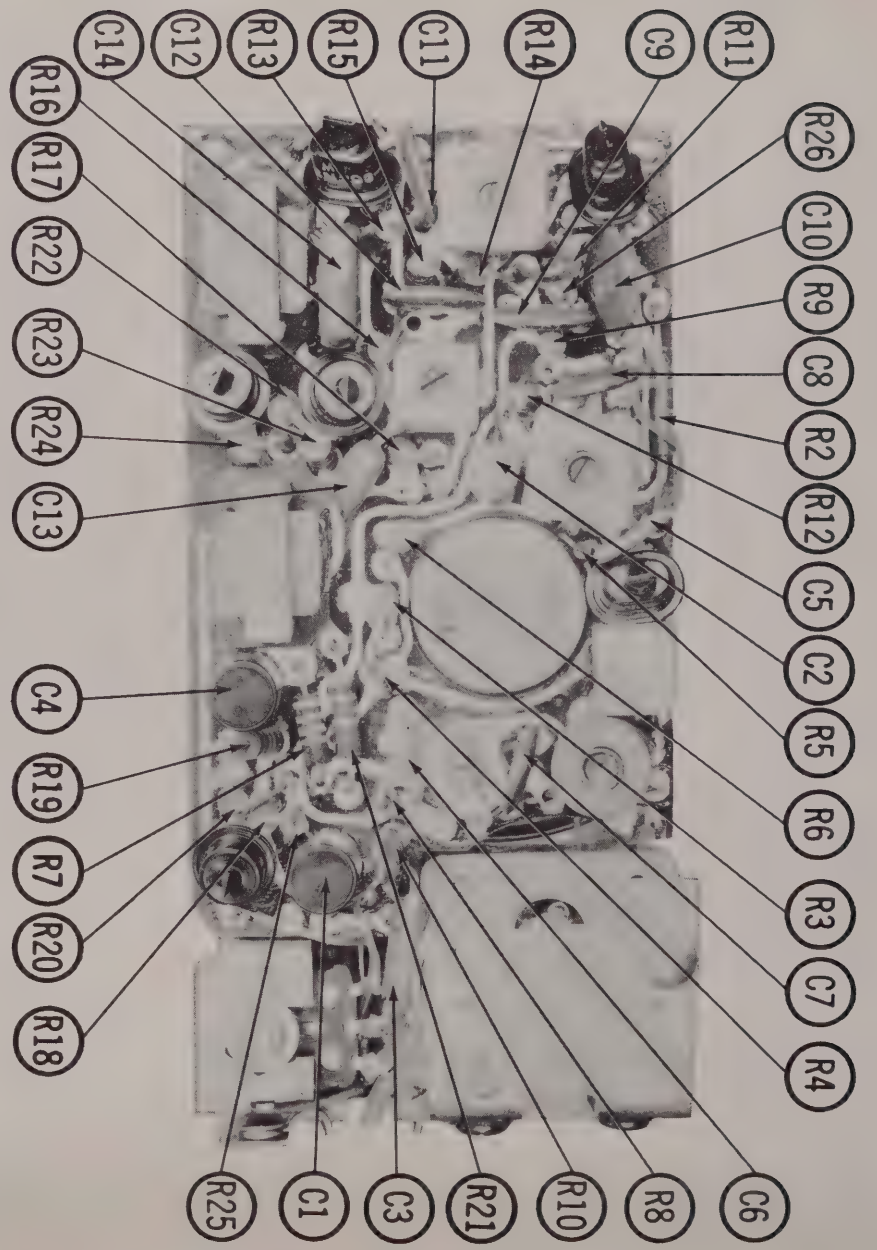
ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	40000			21B635399	BPD-05	DA-503	H-05S5	TA-150	3GAB-S47	
C6	40000			21B635399	BPD-05	DA-503	H-05S5	TA-150	3GAB-S47	
C7	10000			21K640366	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C8	10000			21K640366	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C9	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C10	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C11	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C12	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C13	40000			21B635399	BPD-05	DA-503	H-05S5	TA-150	3GAB-S47	①
C14	200000			21K642714						

① Some versions may use 400000mmf in this application (Part #21K642714). Manufacturer recommends 400000mmf as replacement.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	½	18B640209					Volume & Switch

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1500Ω	
R3	68K	
R4	4700Ω	
R5	4700Ω	
R6	82Ω	
R7	33K	
R8	100K	
R9	1000Ω	
R10	3300Ω	

ITEM No.	RATING	REMARKS
R11	2200Ω	
R12	220Ω	
R13	2200Ω	
R14	10K	
R15	100Ω	
R16	470Ω	
R17	1500Ω	
R18	10K	
R19	68K	

ITEM No.	RATING	REMARKS
R20	220Ω	
R21	2700Ω	
R22	10Ω	
R23	68Ω	
R24	10Ω	
R25	100Ω	
R26	27K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	1V641317						Note 1
L2	RF Trans.	24C641016						
L3	Osc. Coil	24K641099						
L4	1st IF Trans.	24K640526						
L5	2nd IF Trans.	24K640527						
L6	3rd IF Trans.	24K637483						

Note 1. Model 7X24W uses Part #1V640383; Model 7X23E uses Part #1V640381.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1	1	25K640349						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	325Ω CT	13Ω	25K637642	TR-16			TA-20	TR-16		

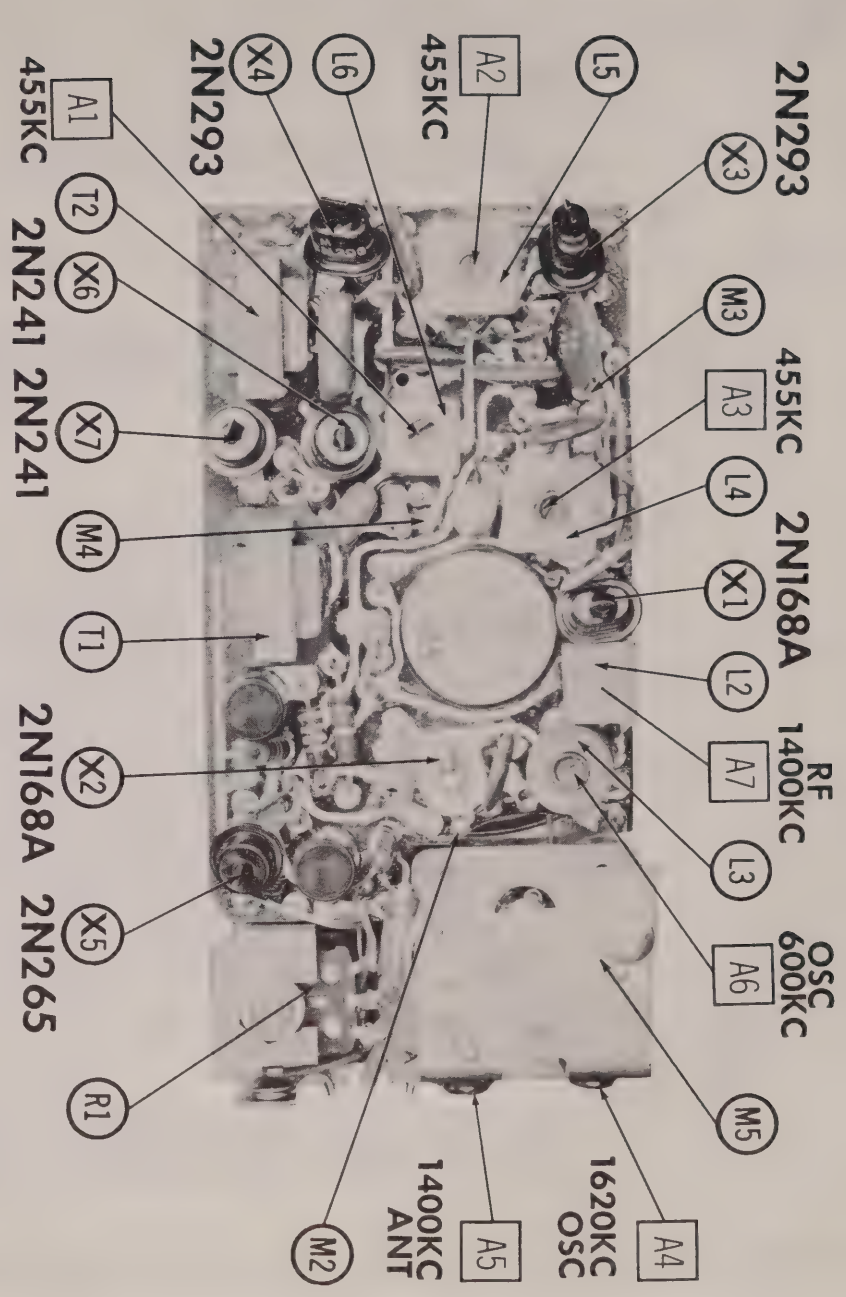
SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	2 3/4"	PM	14-15Ω	50B641011		

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V			930 ①		1015 ① E9 ①②		M-15R① ZM9①②	① 4 Used. ② Mercury Type

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		48K640754	1N60	1N60	1N60	Detector - AVC
M3		48K640754	1N60	1N60	1N60	Overload
M4		48K640754	1N60	1N60	1N60	Osc. Clamper

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Tuning Cap. Printed Board	19B640096 84K640080	2 Gang Does not include Components

CABINETS & CABINET PARTS

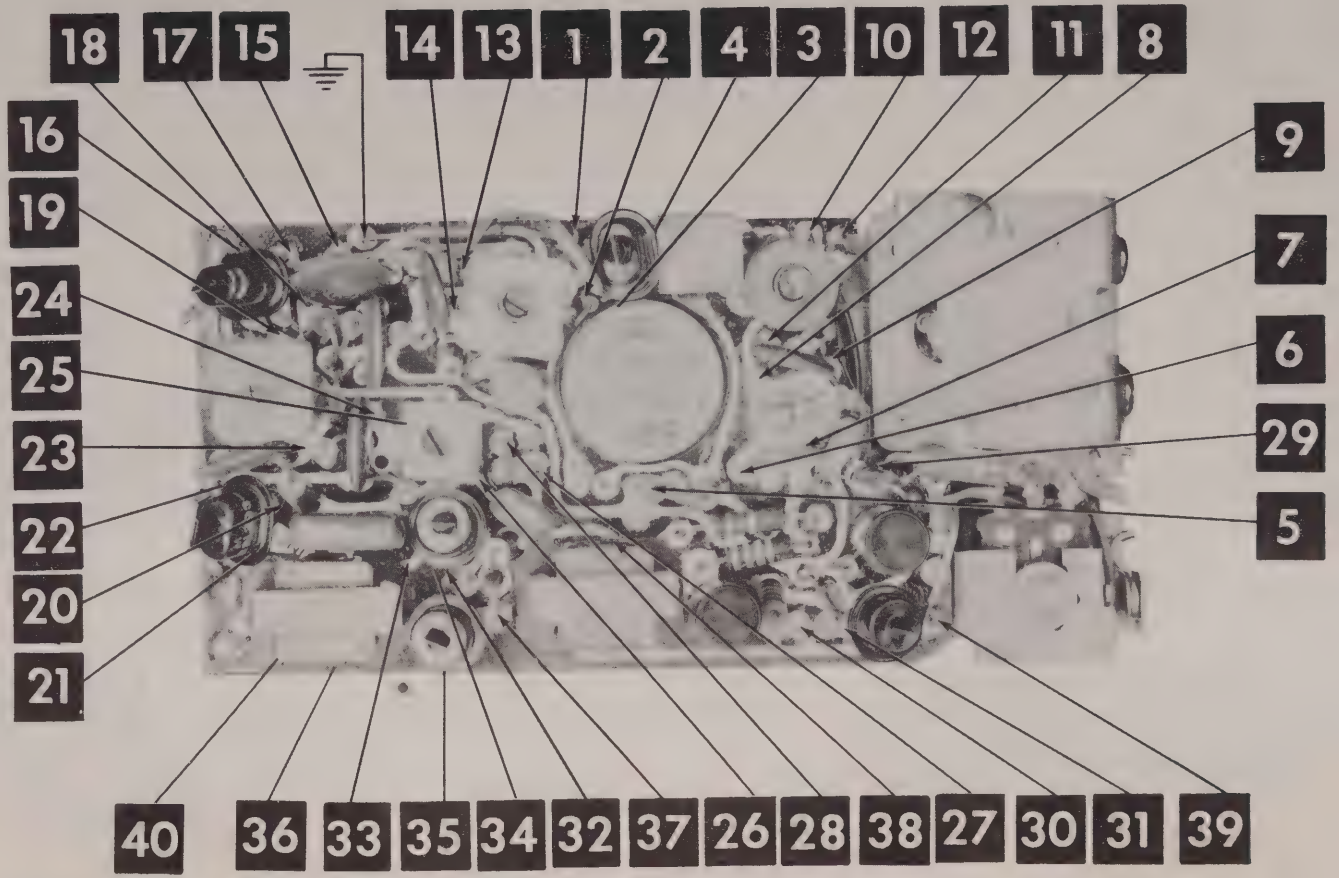
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36B640278	Tuning
Knob	36B640270	Volume
Knob	36B640199	Dial
Cabinet	1V641174	Complete, Suntan, Model 7X24S
Cabinet	1V641175	Complete, Antique White, Less Escutcheon, Model 7X24W
Cabinet	1V641167	Complete, Navy Blue, Less Escutcheon, Model 7X23E
Cabinet Front	16K642008	Suntan, Less Escutcheon, Modes 7X24S
Cabinet Front	16K642010	Antique White, Less Escutcheon, Model 7X24W
Cabinet Front	16K642006	Navy Blue, Less Escutcheon, Model 7X23E
Cabinet Back	1V642012	Gold, Model 7X24S
Cabinet Back	1V642013	Gold, Model 7X24W
Cabinet Back	1V641999	Silver, Model 7X23E
Handle Assembly	1V641317	Brown, Includes Loop Antenna, Model 7X24S
Handle Assembly	1V640383	White, Includes Loop Antenna, Model 7X24W
Handle Assembly	1V640381	Navy Blue, Includes Loop Antenna, Model 7X23E

DISASSEMBLY

1. Remove escutcheon mounting screw from inside cabinet below tuning gang.
2. Insert screwdriver under escutcheon and work free.
3. Remove tuning knob and dial by pulling.
4. Remove chassis mounting screw.
5. Turn handle perpendicular to chassis. Grasp handle near one end and pull out from side of cabinet to free mounting bushing. Lift this side slightly away from cabinet. Repeat for other end of handle.
6. Lift handle, chassis and speaker away from cabinet.
7. Unscrew earphone jack.

If necessary for further disassembly, proceed as follows:
Unsolder: Wire connecting gang to chassis, speaker lug, lead from earphone jack, 3 volume control leads, 3 mounting lugs.
Free chassis by working away from each mounting lug.



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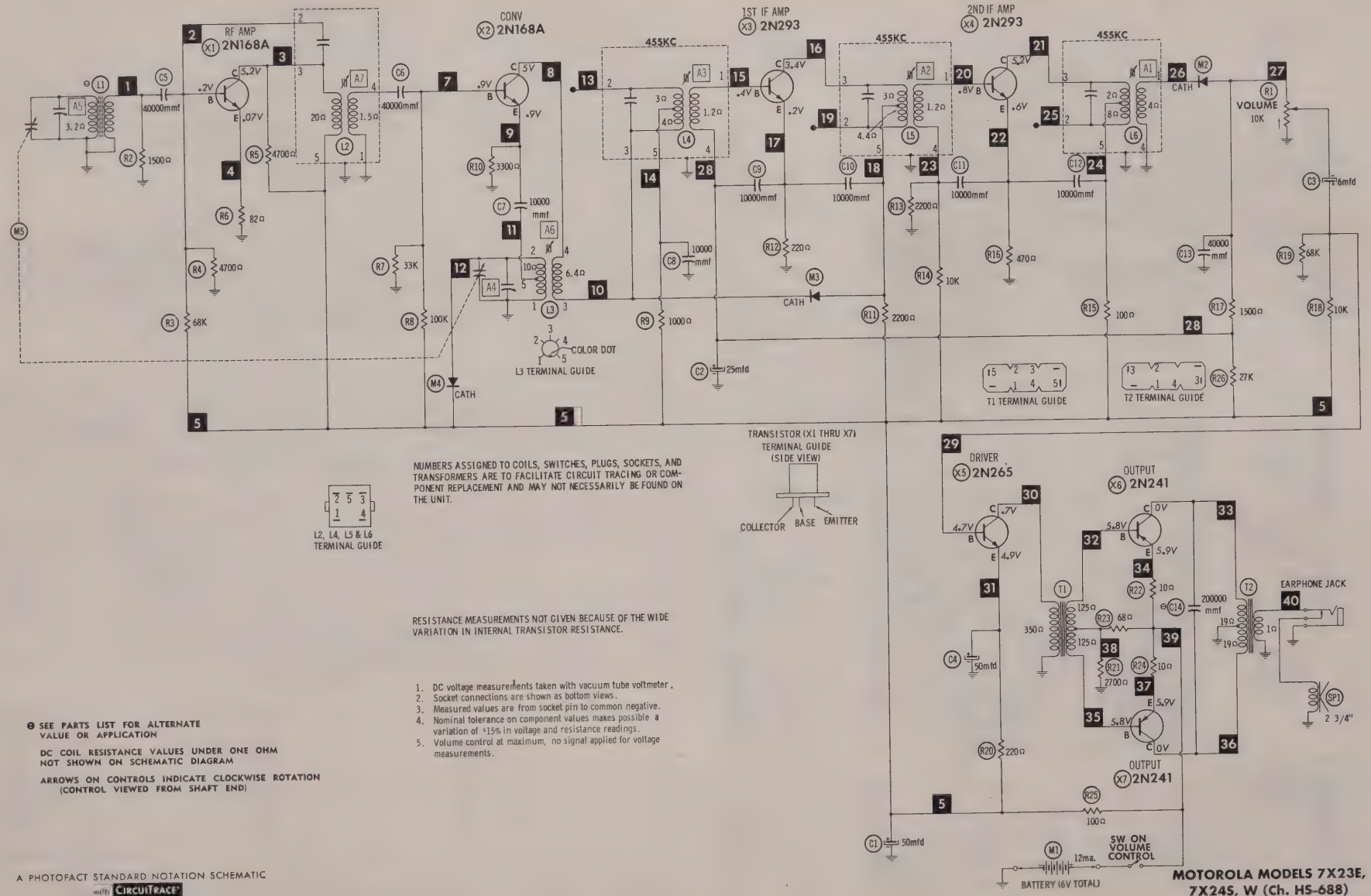
PRINTED BOARD



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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MOTOROLA MODELS 7X23E, 7X24S, W (Ch. HS-688)

PHOTOFACT* Folder

EIA MEMBER

OLYMPIC
MODEL 655

OLYMPIC
MODEL 655

OLYMPIC
MODEL 655

TRADE NAME	Olympic Model 655
MANUFACTURER	Olympic Radio & Tel., Inc., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 5 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 62 Watts, .63 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RX25908-1 — SEE SIMILAR V-M 959 — PHOTOFACT SET 396 FOLDER 13

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT269

SET 462 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Channel A AF Amp.	12AX7
V2	Channel A Output	EL84/6BQ5
V3	Channel B AF Amp.	12AX7
V4	Channel B Output	EL84/6BQ5
V5	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	350	CO33801	PR3-025	BBRT0235	WT460	TD-60-350	TVA-1613	①
B	60	350					TD-60-350	TVA-1613	
C2	10	450	CO4022-2	PRS450V10	BR1045	TC72	TD-10-450	TVA-1705	
C3	20	25	CO4651	SRE25V20	BBR10-25	TT25X20	ML20-25	TE-1206	
C4	20	25	CO4651	SRE25V20	BBR10-25	TT25X20	ML20-25	TE-1206	

① An Alternate 60/100 mfd@350V may be used in some versions (Part #CO26185).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	1000			CCD102M	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C6	.05	50		CO4765-1	P288N-05	DDA-503	H-05S5	TA-150	TG-S50	
C7	.1	400		COM4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	①
C8	.1	400		COM4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C9	.047	400		COM4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	.0047	600		COH6472M	P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C11	1000			CCD102M	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C12	.05	50		CO4765-1	P288N-05	DDA-503	H-05S5	TA-150	TG-S50	
C13	.1	400		COH4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	①
C14	.1	400		COH4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C15	.047	400		COH4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C16	.0047	600		COH6472M	P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C17	.047	400		COM4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	2.2mfd	3					WMF1W2E			
C19	2.2mfd	3					WMF1W2E			

① Some versions may use .05mfd 50V in this application (Part #CO4765-1).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg *	½	PT25963				UE1726	Loudness, Channel A
B	1meg *	½						Loudness, Channel B
R2A	500K †	½	PT25961				UE1727S	Treble, Channel A,
B	500K †	½						Treble, Channel B,
C	Switch							Off-On
R3A	1meg	½	PT25962				UE1728	Bass, Channel A
B	1meg	½						Bass, Channel B

* Taps@350K & 700K
† Tap@250K

RESISTORS

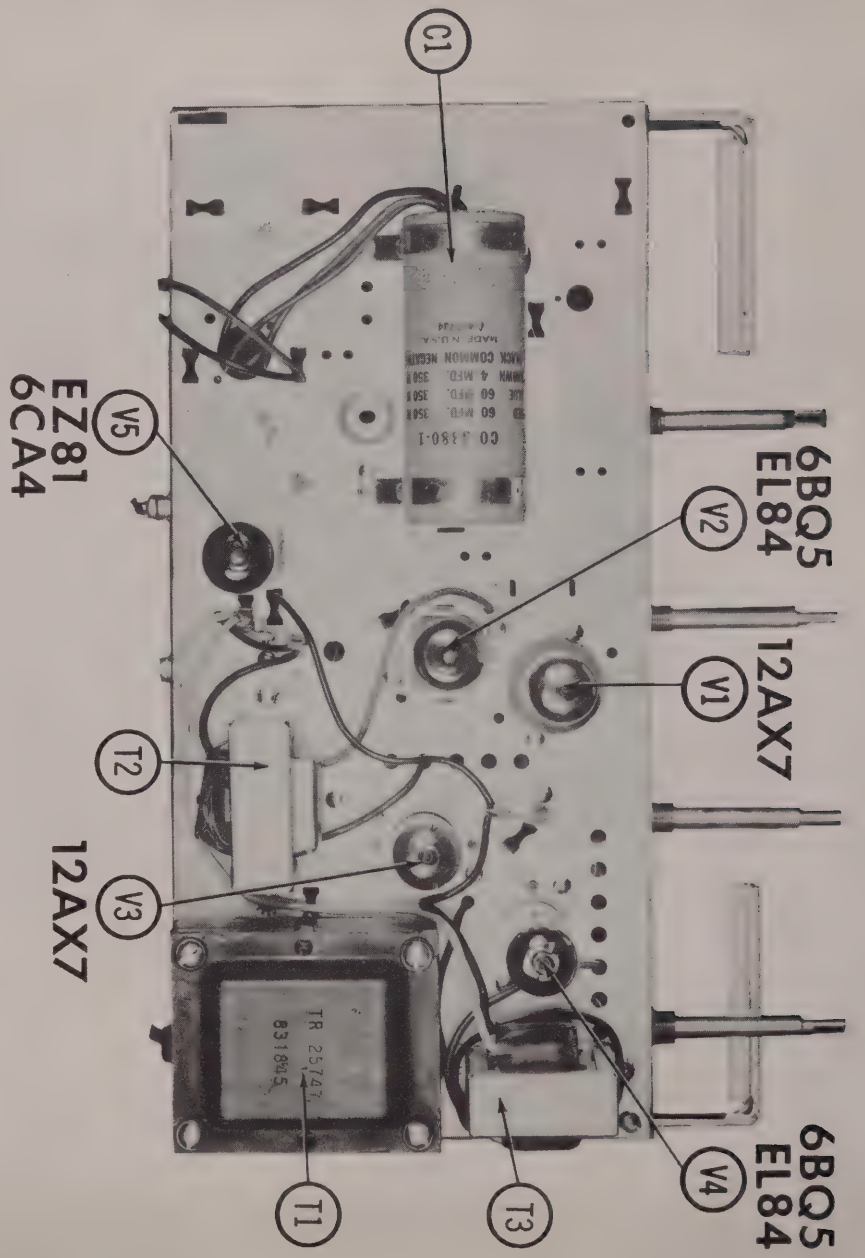
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	220K	
R5	6.8meg	
R6	220K	
R7	470K	
R8	4700Ω	
R9	470K	

ITEM No.	RATING	REMARKS
R10	150Ω 1W	
R11	220K	
R12	6.8meg	
R13	220K	
R14	470K	
R15	4700Ω	

ITEM No.	RATING	REMARKS
R16	470K	
R17	150Ω 1W	
R18	47K	
R19	400Ω 10W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Loudness Comp. (Ch. A)	50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	PC25420	Centralab PC-325 Sprague TC-5
K2	Tone Comp. (Ch. A)	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	PC5648	Centralab PC-190 Sprague TC-1
K3	Loudness Comp. (Ch. B)	50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	PC25420	Centralab PC-325 Sprague TC-5
K4	Tone Comp. (Ch. B)	100mmf, 4700mmf, 4700mmf, 1000Ω, 100K, 100K, 470K	PC5648	Centralab PC-190 Sprague TC-5

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .63A	520 VCT @ .095 A	6.3V@ 3.2A	TR25747		P-3048				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5300Ω	6-8Ω	TR25922	24S64	A-2901	AU-604	A-3823	24S64	S-53X	
T3	5500Ω	6-8Ω	TR26020	24S60	A-2900	AU-608	A-3856	24S60	S-51X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	SK1906	8A31	
SP2	3½"	PM	3-4Ω	SK25463	3A1Z4.3	
SP3	3½"	PM	3-4Ω	SK4076-2	3A15T	
SP4	8"	PM	3-4Ω	SK1906	8A31	
SP5	3½"	PM	3-4Ω	SK25463	3A1Z4.3	
SP6	3½"	PM	3-4Ω	SK4076-2	3A15T	

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M1	Switch	SW2689	Function
M2	Switch		Speaker (Slide Type, DPDT)

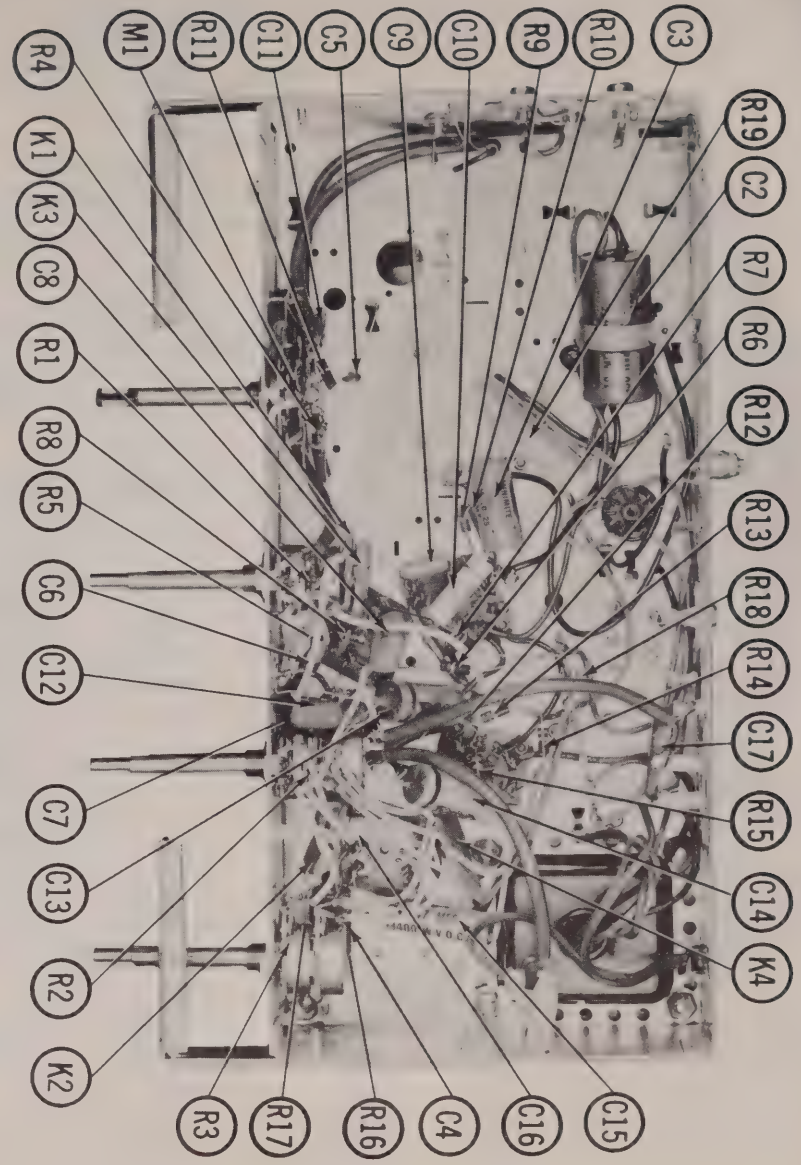
CABINETS & CABINET PARTS

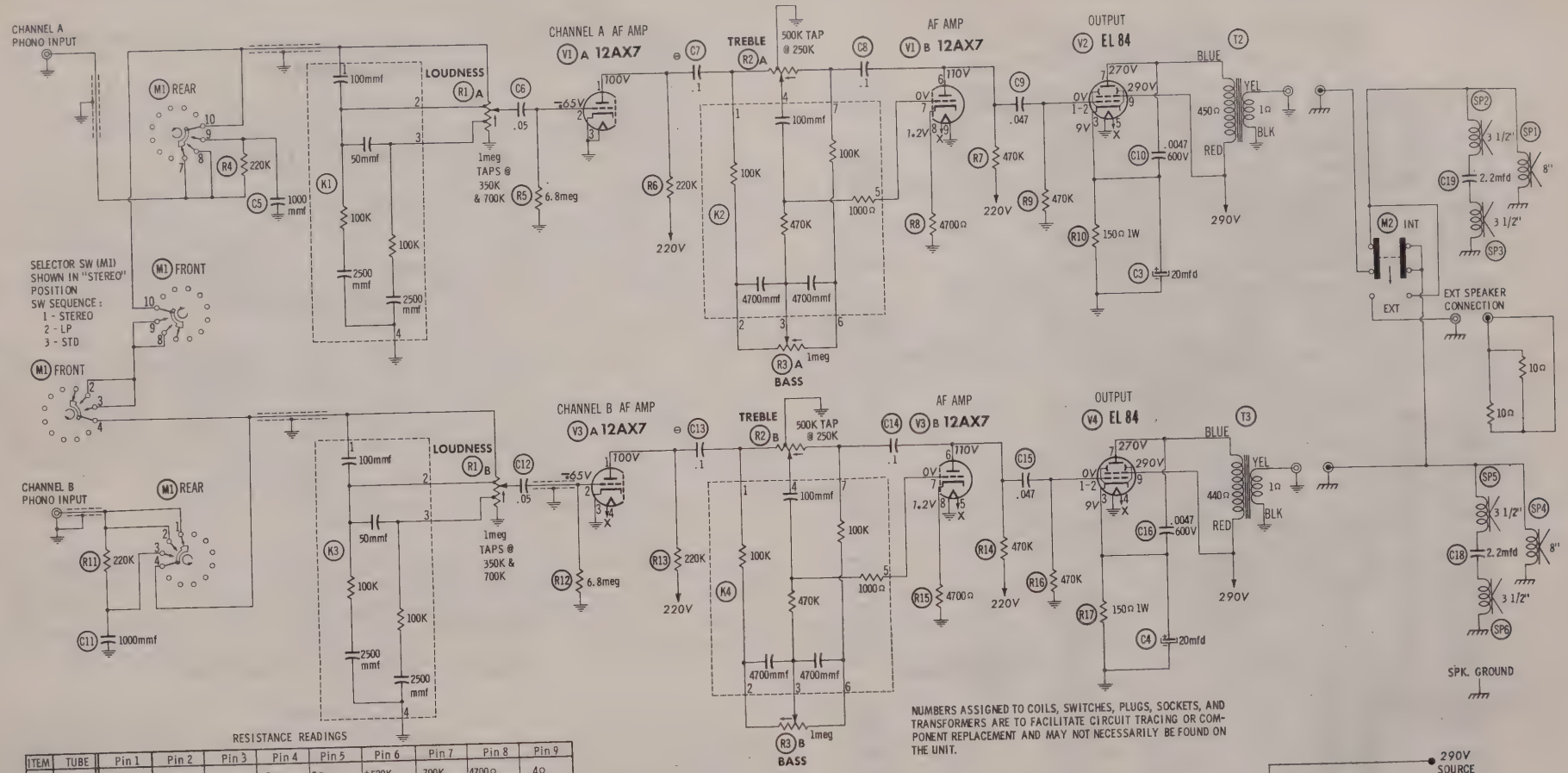
When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

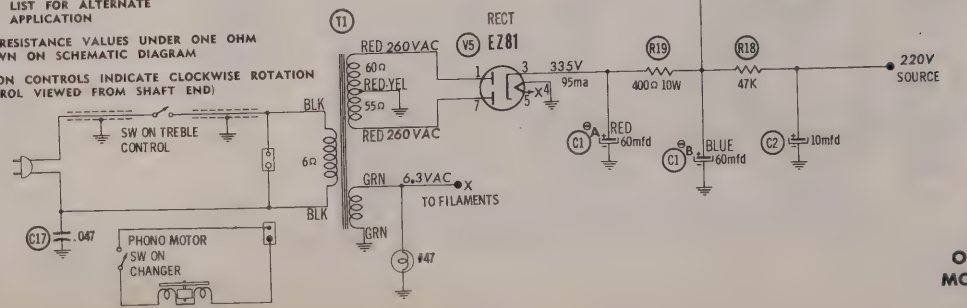
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	6.8meg	0Ω	0Ω	0Ω	†520K	700K	4700Ω	.4Ω
V2	EL84 6BQ5	470K	470K	150Ω	0Ω	.4Ω	NC	†850Ω	NC	†400Ω
V3	12AX7	†270K	6.8meg	0Ω	.4Ω	.4Ω	†520K	700K	4700Ω	0Ω
V4	EL84 6BQ5	470K	470K	150Ω	.4Ω	0Ω	NC	†850Ω	NC	†400Ω
V5	EZ81 6CA4	60Ω	TP	¶	0Ω	.4Ω	NC	55Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
† MEASURED FROM PIN 3 OF V5
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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OLYMPIC MODEL 655

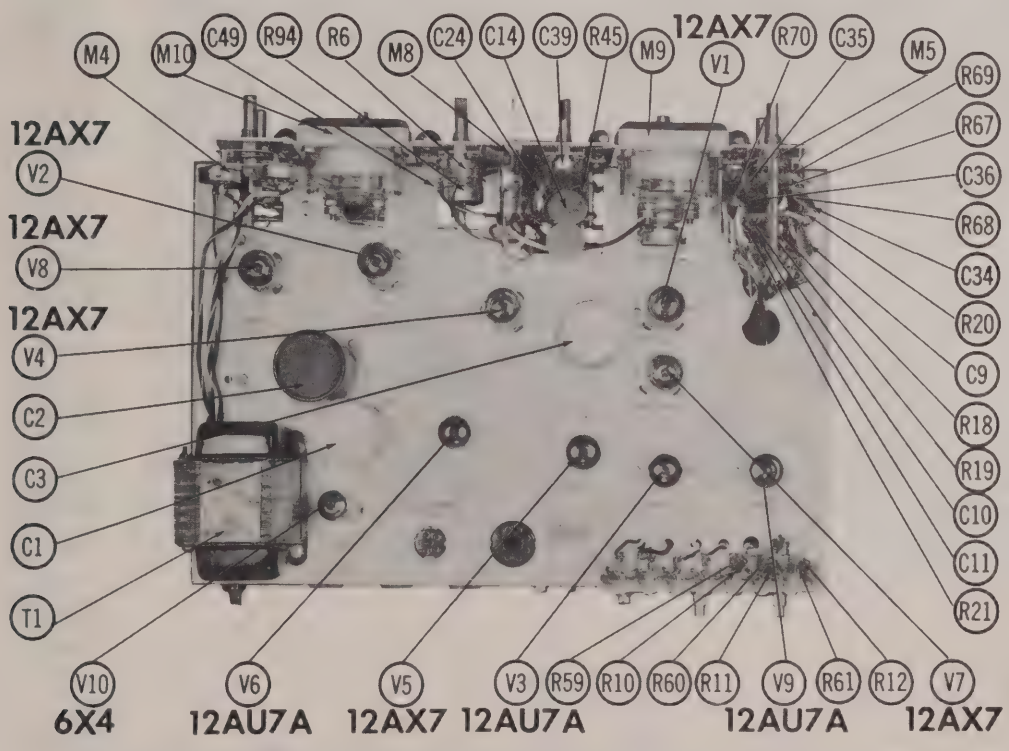
PHOTOFACT* Folder

EIA MEMBER

Howard W. Sams

PILOT MODELS
SP-216, A

TRADE NAME	Pilot Models SP-216, SP-216A
MANUFACTURER	Pilot Radio Corp., 37-06 36th St., Long Island City 1, N. Y.
TYPE SET	AC Operated 10 Tube Stereo Preamplifier
POWER SUPPLY	105-120 Volts AC, 60 Cycle RATING 44 Watts, .48 Amp. @ 117 Volts AC



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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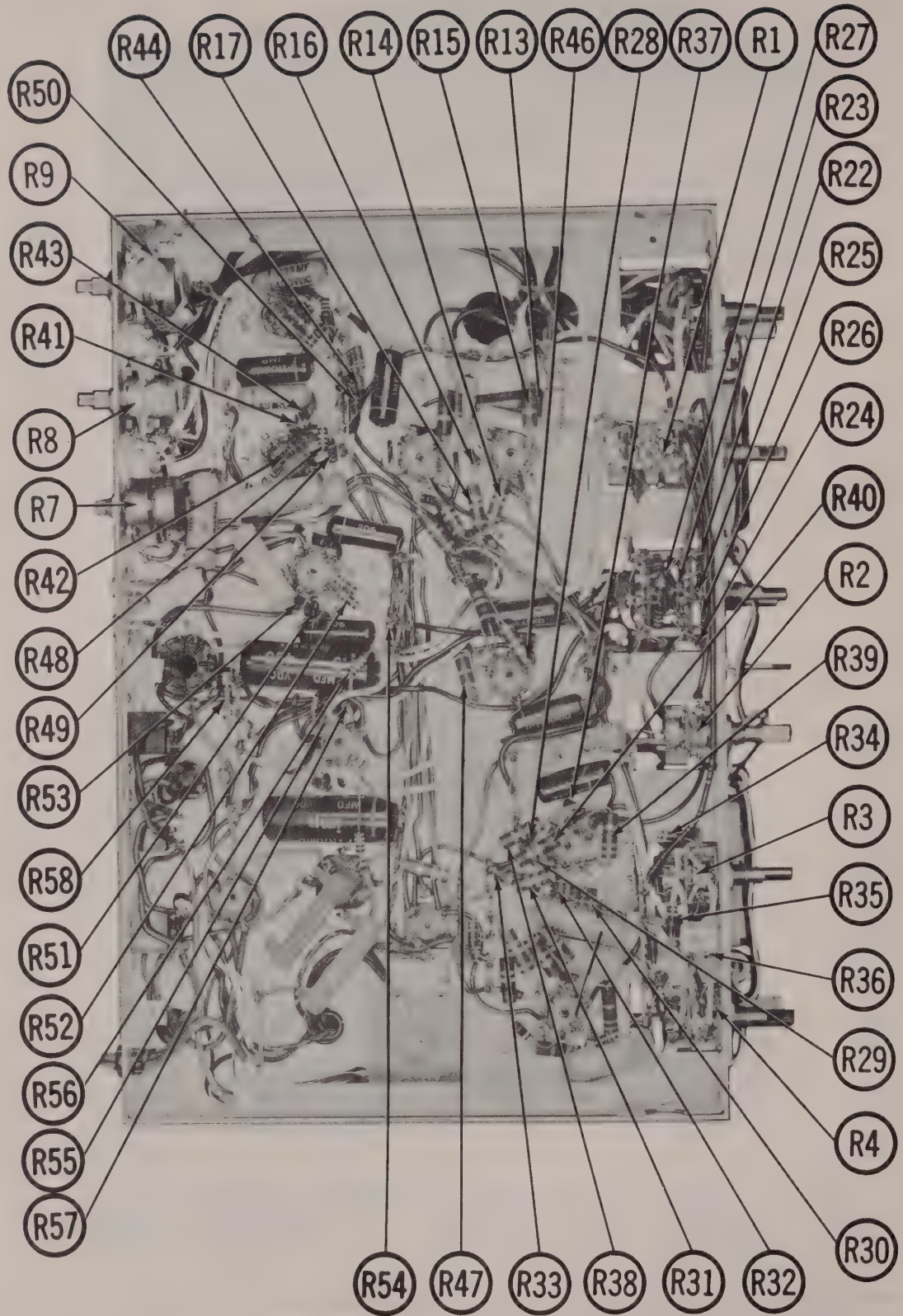
the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

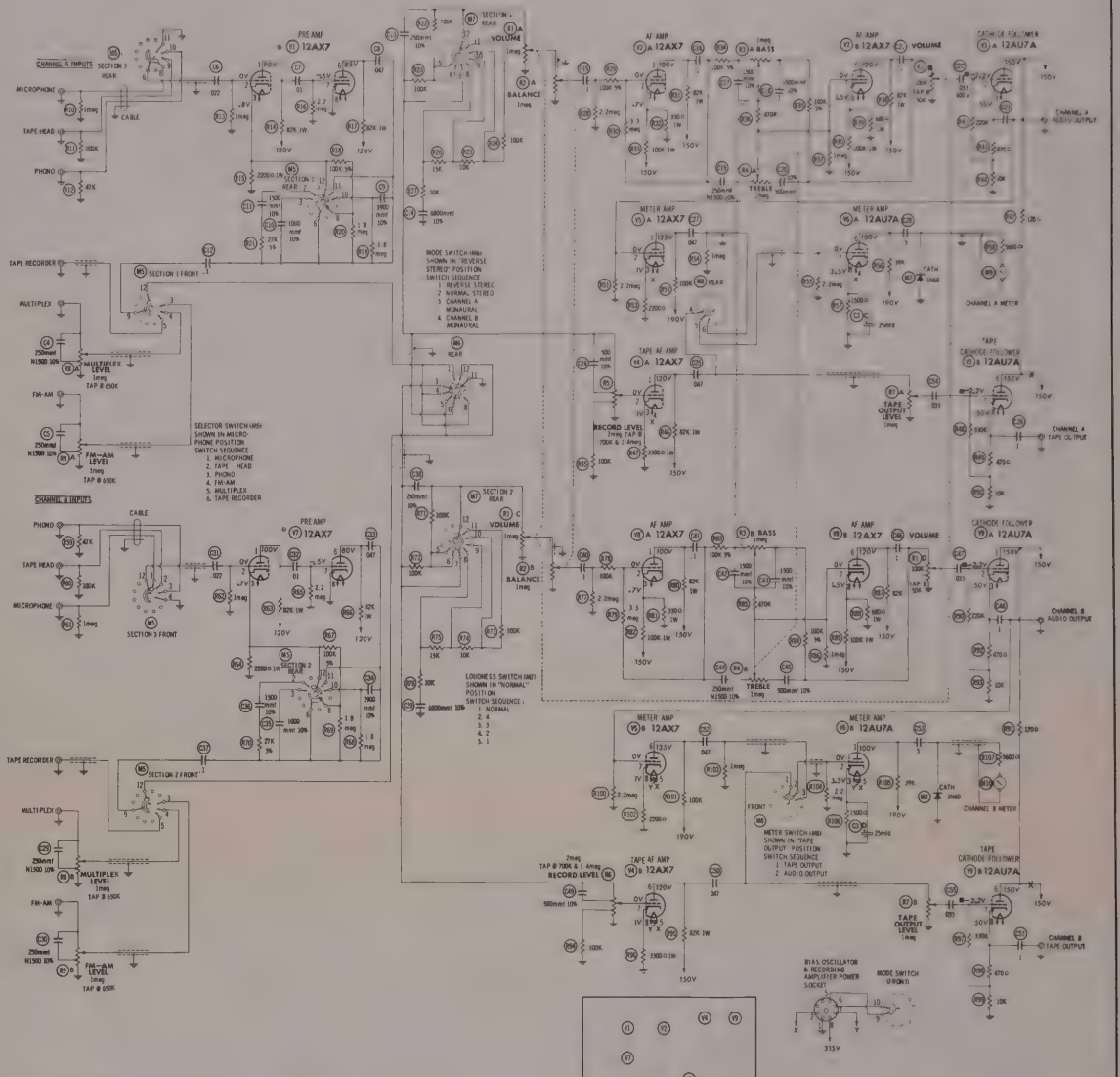
PILOT MODELS
SP-216, A

PILOT MODELS
SP-216, A

SET 462 FOLDER 14



CHASSIS BOTTOM VIEW - RESISTOR IDENT.


CHANNEL A INPUTS
MICROPHONE
TAPE HEAD
PHONO
CABLE
PRE AMP
12AX7
SECTION 3 REAR
SECTION 1 REAR
SECTION 1 FRONT
MULTIPLEX
FM-AM
MULTIPLEX LEVEL
FM—AM LEVEL
TAPE RECORDER
SELECTOR SWITCH (MS) SHOWN IN MICROPHONE POSITION
SECTION 2 REAR
SECTION 2 FRONT
SECTION 3 FRONT
CHANNEL B INPUTS
SECTION 1 REAR VOLUME
SECTION 2 REAR VOLUME
A BALANCE
B BALANCE
MODE SWITCH (M6) SHOWN IN "REVERSE STEREO" POSITION
1 REVERSE STEREO
2 NORMAL STEREO
3 CHANNEL A MONAURAL
4 CHANNEL B MONAURAL
LOUDNESS SWITCH (M7) SHOWN IN "NORMAL" POSITION
AF AMP
12AX7
A BASS
B BASS
VOLUME
TREBLE
METER AMP
CATHODE FOLLOWER
12AU7A
CHANNEL A AUDIO OUTPUT
CHANNEL B AUDIO OUTPUT
CHANNEL A METER
CHANNEL B METER
TAPE AF AMP
RECORD LEVEL
TAPE OUTPUT LEVEL
CHANNEL A TAPE OUTPUT
CHANNEL B TAPE OUTPUT
METER SWITCH (M8) SHOWN IN "TAPE OUTPUT" POSITION
1 TAPE OUTPUT
2 AUDIO OUTPUT
BIAS OSCILLATOR & RECORDING AMPLIFIER POWER SOCKET
MODE SWITCH (FRONT)
315V
TUBE LAYOUT (BOTTOM VIEW)
CHANNEL A INPUT
PHONO TT (TURNTABLE)
PHONO RC (RECORD CHANGER)
TO TERMINAL 10 OF SELECTOR SWITCH (MS) SECTION 3 REAR
MODE SWITCH (FRONT)
CHANNEL B INPUT
TO TERMINAL 3 OF SELECTOR SWITCH (MS) SECTION 3 FRONT
INPUT CIRCUIT USED IN MODEL 216A
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 5% in voltage and resistance readings.
6. All controls at minimum, proper output load connected
RECT 6X4
250VAC
150 V CHANNEL A SOURCE
150 V CHANNEL B SOURCE
120 V SOURCE
315V SOURCE
POWER SWITCH (M4) SHOWN IN AUTOMATIC POSITION SWITCH SEQUENCE
FUNCTION
SWITCH 1
SWITCH 2
Automatic
Off
On
AC RECEPTACLE
PHONO MOTOR SOCKET
RED-BLK
BLK
BRN
GRN
BLUE
605ma.
12V
30V
3.7V
RESISTANCE READINGS
ITEM
TUBE
Pin 1
Pin 2
Pin 3
Pin 4
Pin 5
Pin 6
Pin 7
Pin 8
Pin 9
V1 12AX7 105K 1meg 220Ω 170Ω 170Ω 105K 2.2meg 0Ω 170Ω
V2 12AX7 90K 1.5meg 150Ω 120Ω 170Ω 90K 650K 680Ω 170Ω
V3 12AU7A 6,000Ω 250K 10K 120Ω 170Ω 6000Ω 140K 10K 170Ω
V4 12AX7 90K 0Ω 3300Ω 15K 15K 90K 0Ω 3300Ω 15K
V5 12AX7 105K 2.2meg 220Ω 15K 15K 105K 2.2meg 220Ω 15K
V6 12AU7A 42K 150K 1500Ω 15K 15K 42K 150K 1500Ω 15K
V7 12AX7 105K 1meg 220Ω 170Ω 170Ω 105K 2.7meg 0Ω 170Ω
V8 12AX7 90K 1.6meg 150Ω 120Ω 120Ω 90K 650K 680Ω 170Ω
V9 12AU7 6000Ω 250K 10K 170Ω 170Ω 6000Ω 140K 10K 170Ω
V10 6X4 1MΩ NC 15K 15K NC 80Ω ¶ — — —
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
† MEASURED FROM PIN 7 OF V10
● MEASURED FROM CATHODE
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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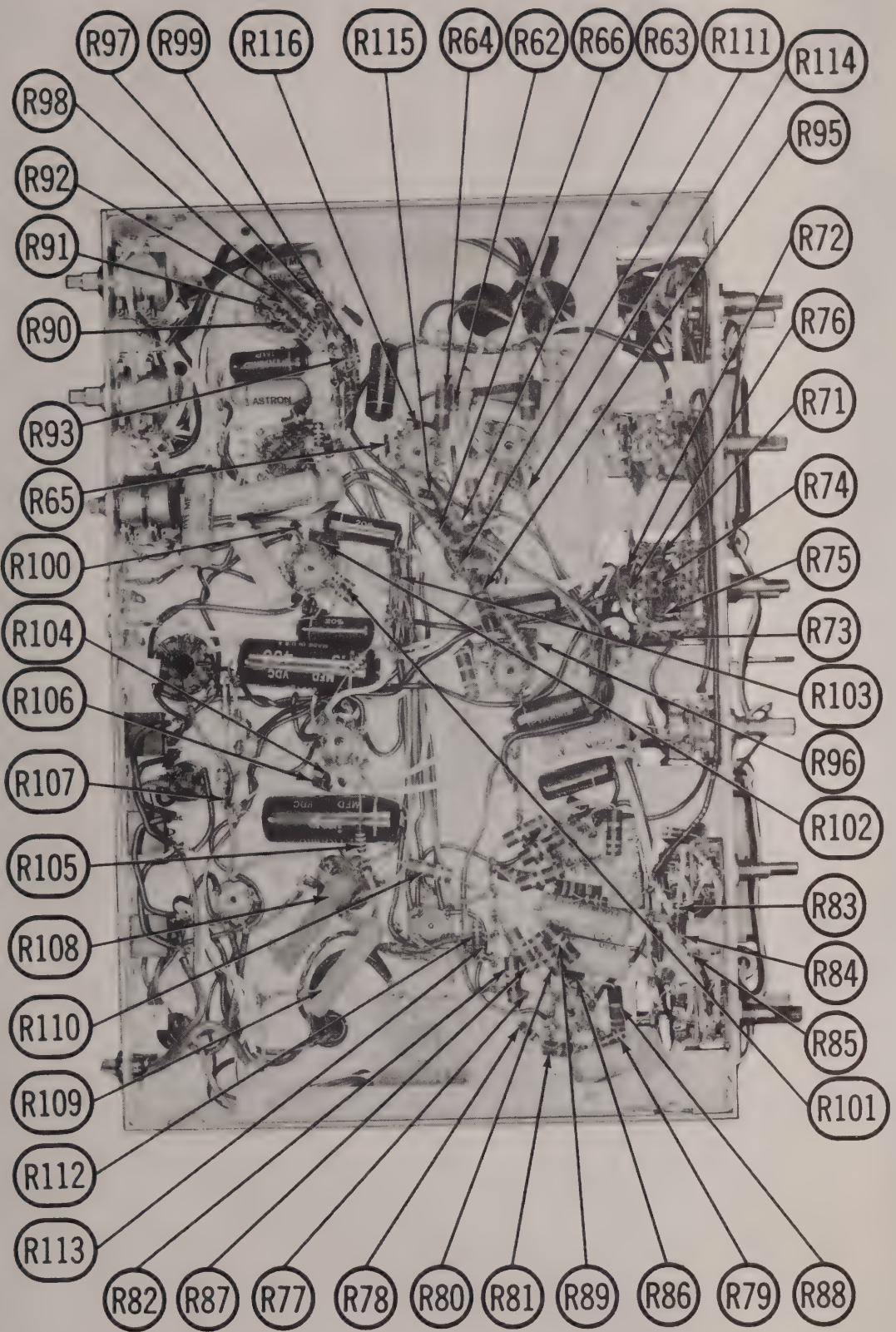
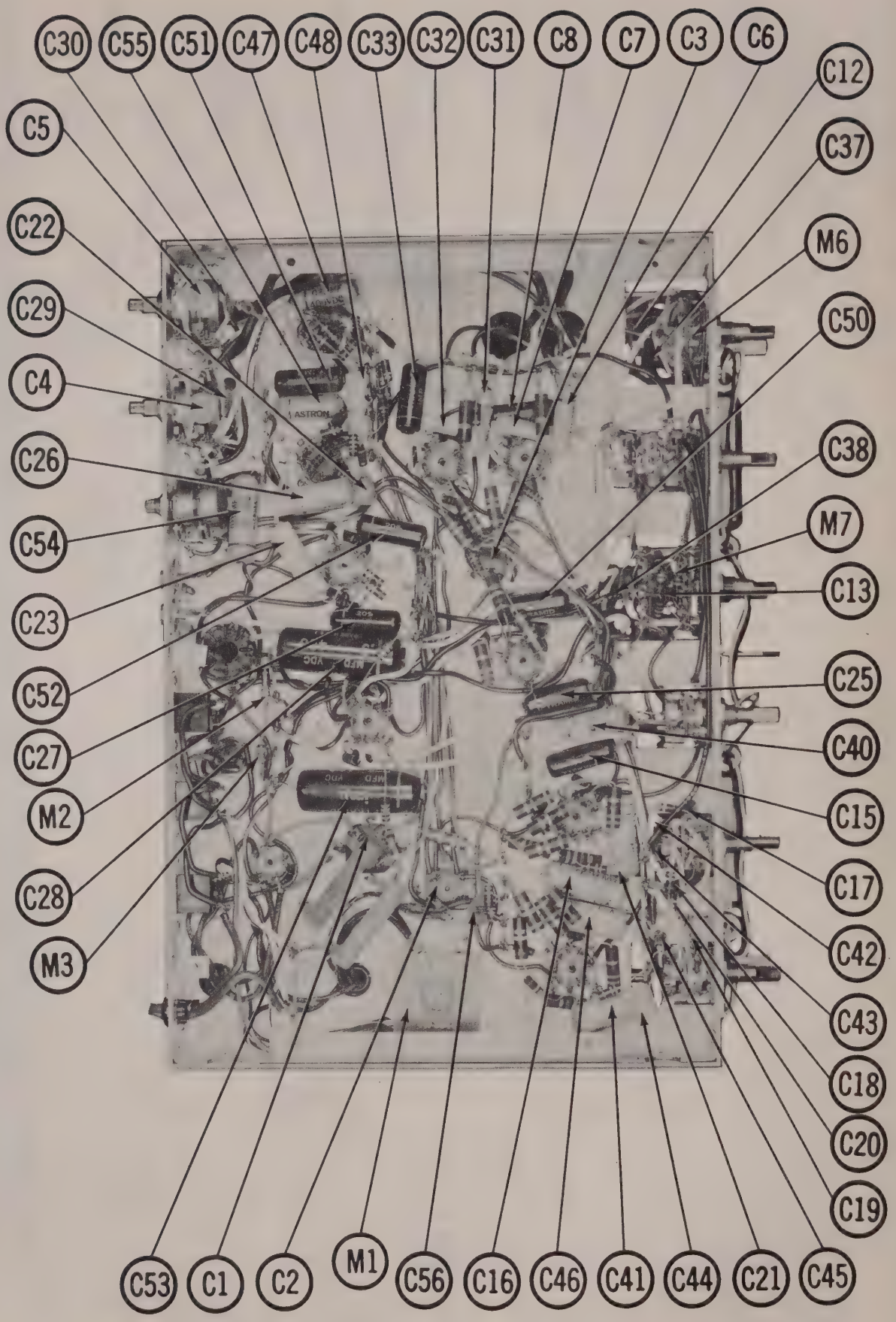
PILOT MODELS SP-216, A



CHASSIS BOTTOM VIEW - RESISTOR IDENT.



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Preamp.	12AX7 (7025)*	V6	Channel A Meter Amp. - Channel B Meter Amp.	12AU7A
V2	Channel A AF Amp.	12AX7	V7	Channel B Preamp.	12AX7 (7025)*
V3	Channel A Cathode Follower- Channel A Tape Cathode Follower	12AU7A	V8	Channel B AF Amp.	12AX7
V4	Channel A Tape AF Amp. - Channel B Tape AF Amp.	12AX7	V9	Channel B Cathode Follower -Channel B Tape Cathode Follower	12AU7A
V5	Channel A Meter Amp. - Channel B Meter Amp.	12AX7	V10	Rectifier	6X4

* Alternate.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	24-164		C0194	FP227.5 TC78	TMD-36 TD-80-350	TVL-3583	
B	■80	300							
C	▲40	300							
C2A	▲1000	25	24-162		A0130		FP430.2	TVLS-3290 *	
B	■200	25			BR2502				
C	▲200	25			BR2502				
C3A	▲40	300	24-169	AFH4-44	D0367	FP430.2	TMQ-56	TVLS-4560.*	
B	■20	300							
C	▲25	10							
D	25	10							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	250		N1500 10%							
C5	250		N1500 10%							
C6	.022	400			P488N-022		CUB4S22	GEM-4122	4TM-S22	
C7	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C8	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	3900		10%		DI-3900		PM6D39	JL-239	6TM-D4	
C10	1000		10%		DI-1000		PM6D1	JL-210	6TM-D1	
C11	1500		10%		DI-1500		PM6D15	JL-215	6TM-D15	
C12	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C13	250		10%		DI-250	MD-251	L10T25	MCB240	MS-325	
C14	6800		10%				PM6D68	GTM-6268	6TM-D68	
C15	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C16	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C17	1500		10%		DI-1500		PM6D15	JL-215	6TM-D15	
C18	1500		10%		DI-1500		PM6D15	JL-215	6TM-D15	
C19	250		N1500 10%							
C20	500		10%		DI-500	MD-501	PM6T5	MCB245	MS-350	
C21	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C22	.033	600			P688N-033		CUB6S33	GEM-6133	6TM-S33	
C23	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C24	500		10%		DI-500	MD-501	PM6T5	MCB245	MS-350	
C25	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C26	.1	200			P288N-1	DF-104	CUB2P1	GEM-2P1	2TM-P1	
C27	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C28	.5	400			P488N-5		CUB4P5	GEM-405	4TM-P5	
C29	250		N1500 10%							
C30	250		N1500 10%							
C31	.022	400			P488N-022		CUB4S22	GEM-4122	4TM-S22	
C32	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C33	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C34	3900		10%		DI-3900		PM6D39	JL-239	6TM-D4	
C35	1000		10%		DI-1000		PM6D1	JL-210	6TM-D1	
C36	1500		10%		DI-1500		PM6D15	JL-215	6TM-D15	
C37	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C38	250		10%		DI-250	MD-251	L10T25	MCB240	MS-325	
C39	6800		10%				PM6D68	GTM-6268	6TM-D68	
C40	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-2P1	
C41	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-4P1	
C42	1500		10%		DI-1500		PM6D15	JL-215	6TM-D15	
C43	1500		10%		DI-1500		PM6D15	JL-215	6TM-D15	
C44	250		N1500 10%							
C45	500		10%		DI-500	MD-501	PM6T5	MCB245	MS-350	
C46	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C47	.033	400			P488N-033		CUB4S33	GEM-4133	4TM-S33	
C48	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C49	500		10%		DI-500	MD-501	PM6T5	MCB245	MS-350	
C50	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C51	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C52	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C53	.5	400			P488N-5		CUB4P5	GEM-405	4TM-P5	
C54	.033	400			P488N-033		CUB4S33	GEM-4133	4TM-S33	
C55	.033	400			P488N-033		CUB4S33	GEM-4133	4TM-S33	
C56	10000	1000			DAC-27	DD-103	BYA10S1	B-110	5HK-S1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PILOT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1/2	36-71			Q11-137		Volume, Channel A
B	100K *	1/2				M11-128		Volume, Channel A
C	1meg	1/2				M11-128		Volume, Channel B
D	100K *	1/2				M11-128		Volume, Channel B
R2A	1meg	1/2	39-57				■ UE4008	Balance, Channel A
B	1meg	1/2						Balance, Channel B
R3A	1meg	1/2	37-39	B-69	AD47-1meg-S	Q11-137	▲ UE1707	Bass, Channel A
B	1meg	1/2		SR-69	Not Req.	M11-137		Bass, Channel B
C	Shaft			Not Req.	FS-3	Not Req.		
R4A	1meg	1/2	37-39	B-69	AD47-1meg-S	Q11-137	▲ UE1707	Treble, Channel A
B	1meg	1/2		SR-69	Not Req.	M11-137		Treble, Channel B
C	Shaft			Not Req.	FS-3	Not Req.		
R5	2meg †	1/2	39-59	BT-175		Q13-139XX	UDT-296	Record Level, Channel A
R6	2meg †	1/2	39-59	BT-175		Q13-139XX	UDT-296	Record Level, Channel B
R7A	1meg	1/2	39-56	AB-69	AD47-1meg-S	Q11-137	▲ UE1707	Tape Level, Channel A
B	1meg	1/2		SR-69	Not Req.	M11-137		Tape Level, Channel B
C	Shaft			AK-9	RS-2	PQ		
R8A	1meg ‡	1/2	39-54			♦ QJ-1114R	▲ UE3904	Multiplex Level, Channel A
B	1meg ‡							Multiplex Level, Channel B
R9A	1meg ‡	1/2	39-54			♦ QJ-1114R	▲ UE3904	FM-AM Level, Channel A
B	1meg ‡	1/2						FM-AM Level, Channel B

* Tap @ 50K (Not used) † Tap @ 700K, 1.4meg. ‡ Tap @ 650K

♦ "Concentrikit" Equivalent: K-5 Kit with Base Elements & Shafts: B19-137X, P9-018 (Panel) (Not available as a factory assembled unit.) B19-137X, R12-026 (Rear)

■ "STA-LOC" Equivalent: FA16A, RU16R, CS3500.

▲ "STA-LOC" Equivalent: FA16L, RU16L, CS3500.

▲ "STA-LOC" Equivalent: FB16T55, RU16T654, OK500, IK750.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	1meg	
R11	100K	
R12	47K	
R13	1meg	
R14	82K 1W	
R15	2200Ω 1W	
R16	2.2meg	
R17	82K 1W	
R18	100K 5%	
R19	1.8meg	
R20	1.8meg	
R21	27K 5%	
R22	100K	
R23	100K	
R24	100K	
R25	10K	
R26	15K	
R27	10K	
R28	2.2meg	
R29	100K 5%	
R30	3.3meg	
R31	82K 1W	
R32	330Ω 1W	
R33	100K 1W	
R34	100K 5%	
R35	100K 5%	
R36	470K	
R37	1meg	
R38	82K 1W	
R39	680Ω 1W	
R40	100K 1W	
R41	220K	
R42	120Ω	
R43	470Ω	
R44	10K	
R45	100K	

ITEM No.	RATING	REMARKS
R46	82K 1W	
R47	3300Ω 1W	
R48	330K	
R49	470Ω	
R50	10K	
R51	2.2meg	
R52	100K	
R53	2200Ω	
R54	1meg	
R55	2.2meg	
R56	39K	
R57	1500Ω	
R58	5600Ω	
R59	47K	
R60	100K	
R61	1meg	
R62	1meg	
R63	82K 1W	
R64	2200Ω 1W	
R65	2.2meg	
R66	82K 1W	
R67	100K 5%	
R68	1.8meg	
R69	1.8meg	
R70	27K 5%	
R71	100K	
R72	100K	
R73	100K	
R74	10K	
R75	15K	
R76	10K	
R77	2.2meg	
R78	100K	
R79	3.3meg	
R80	82K 1W	
R81	330Ω 1W	

ITEM No.	RATING	REMARKS
R82	100K 1W	
R83	100K 5%	
R84	100K 5%	
R85	470K	
R86	1meg	
R87	82K	
R88	680Ω 1W	
R89	100K 1W	
R90	220K	
R91	120Ω	
R92	470Ω	
R93	10K	
R94	100K	
R95	82K 1W	
R96	330Ω 1W	
R97	330K	
R98	470Ω	
R99	10K	
R100	2.2meg	
R101	100K	
R102	2200Ω	
R103	1meg	
R104	2.2meg	
R105	39K	
R106	1500Ω	
R107	5600Ω	
R108	3500Ω 5W	
R109	2500Ω 5W	
R110	3300Ω 1W	
R111	15K	
R112	220K	
R113	47K	
R114	680Ω	
R115	680Ω	
R116	330Ω	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		PILOT PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	110-384	1N60	1N60	1N295	Meter Rect. (Pigtail)
M3	1N60	110-384	1N60	1N60	1N295	Meter Rect. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M4	Switch	100-142	Power (Off-On-Auto Shut off)
M5	Switch	100-134	Selector
M6	Switch	100-140	Mode
M7	Switch	100-141	Loudness
M8	Switch	101-44	Meter Function
M9	Meter	110-565	
M10	Meter	110-565	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K ($7\frac{1}{2}$ Ft. Length)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .475A	500VCT @ .030A	38VCT @ .6A	55-62						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 1.6A									

RECTIFIERS

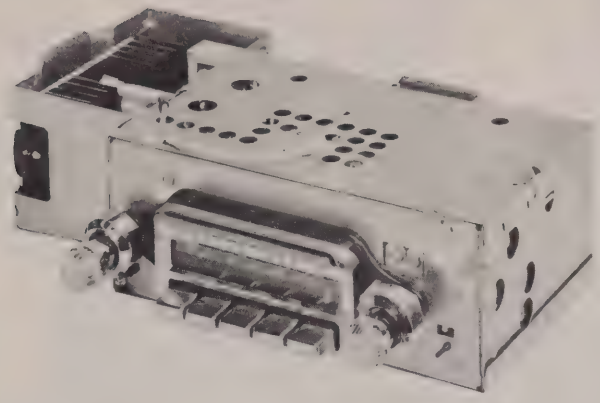
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	PILOT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.603A	110-564 ①			4N33-1C1-RV ①		① Selenium Type.

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PONTIAC MODEL 988977

PONTIAC MODEL 988977



TRADE NAME	Pontiac Model 988977 (For 1959 Pontiac Automobiles)
MANUFACTURER	Delco Radio Div., G. M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated 5 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.7 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	535 - 1616KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

* To tune to high frequency stop, put a .070" feeler gauge against high frequency stop. Turn manual control to allow treadle bar arm to run against feeler gauge.

Suggested Alignment Tools:
A1 thru A4 ..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A6, A7, A8 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5, A9, A10 ..... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	262.5KC (400∿ Mod)	High frequency end stop (See Note *)	DC probe to point (A). Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
	Check setting of oscillator coil core (A5). Rear of core should be 1 5/8" from mounting end of coil form.						
3.	68mmf	High side to antenna receptacle. Low side to chassis.	1615KC	High frequency end stop (See Note *)	DC probe to point (A). Common to chassis.	A6, A7, A8	Adjust for maximum deflection.
4.	"	"	600KC	Tune to 600KC signal	"	A9, A10	Adjust for maximum deflection.
5.	"	"	1615KC	Tune to 1615KC signal	"	A7, A8	"

POINTER ADJUSTMENT

With the radio tuned to an 1100KC signal, adjust pointer adjustment so that pointer coincides with 1100KC mark on dial.

With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A8 for maximum output.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton to the left and out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat for remaining pushbuttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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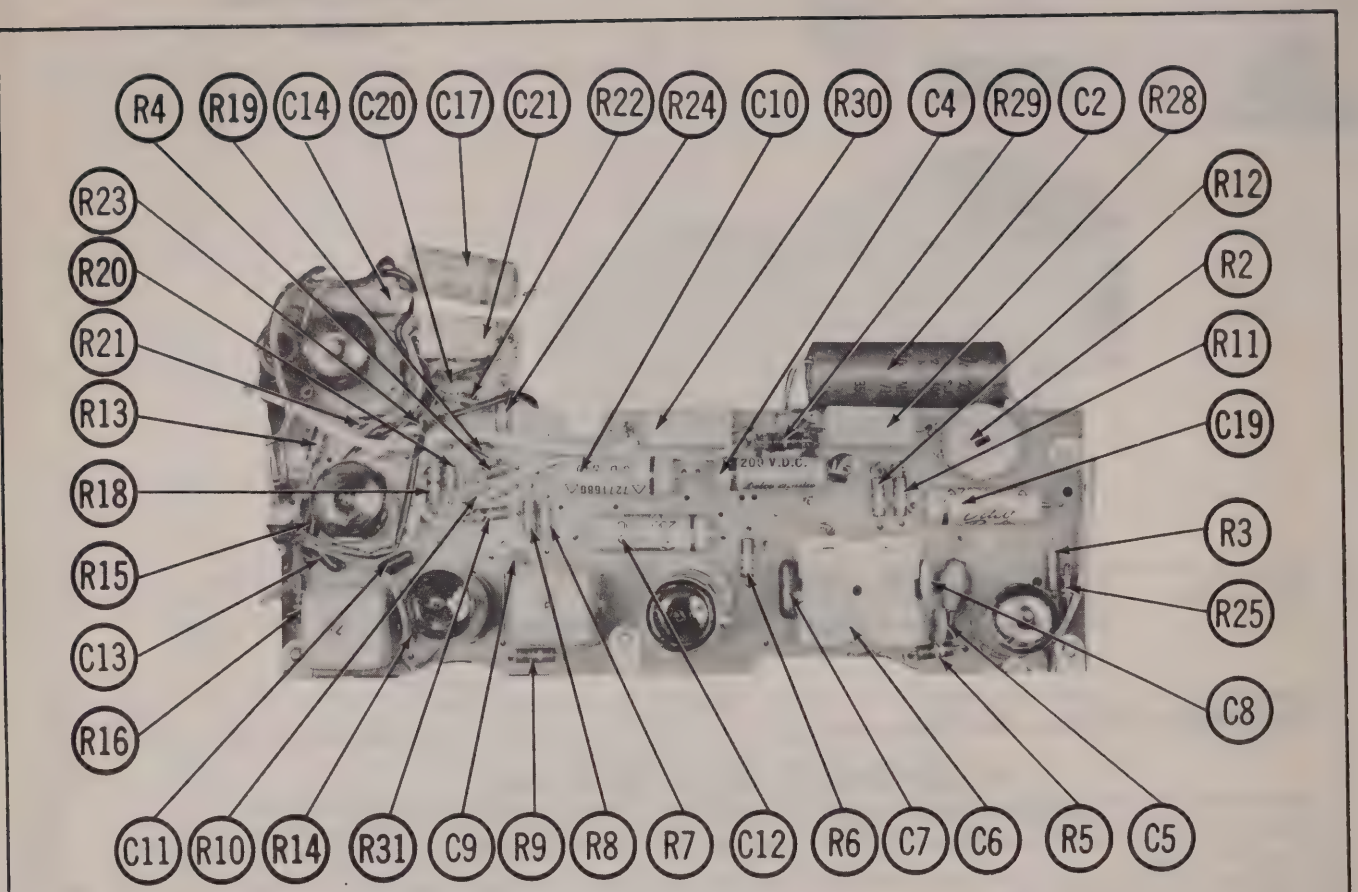

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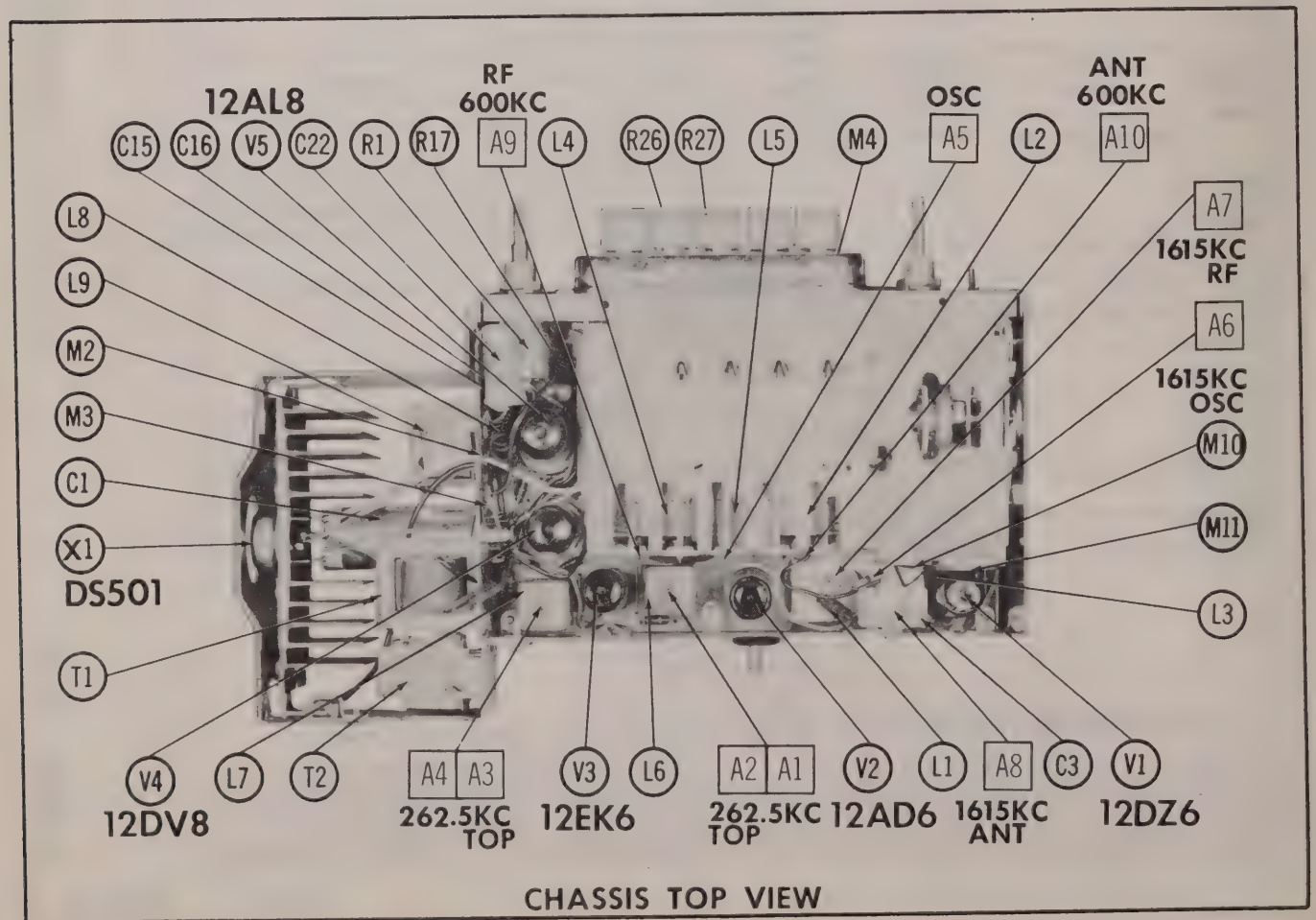
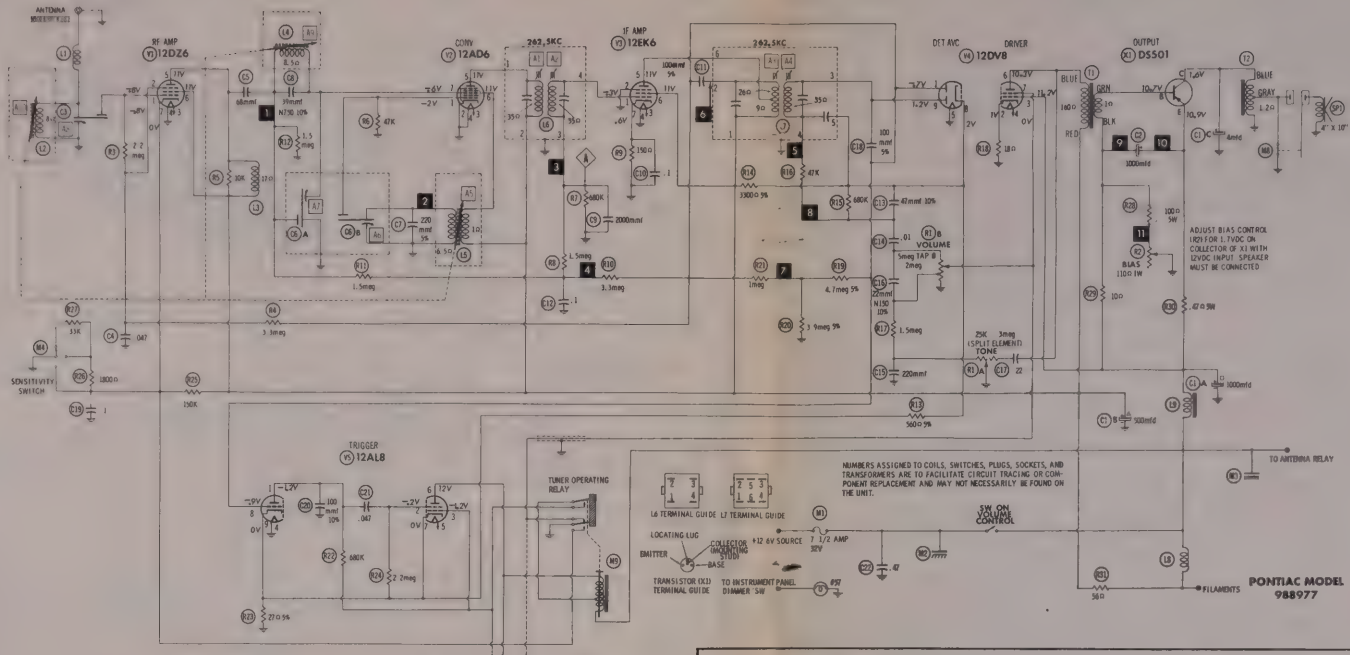


CHASSIS TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DZ6	10meg	7.8meg	.2Ω	0Ω	†75Ω	†36Ω	0Ω		
V2	12AD6	47K	0Ω	.2Ω	0Ω	†90Ω	†57Ω	1meg		
V3	12EK6	600K	0Ω	.2Ω	0Ω	†65Ω	†36Ω	150Ω		
V4	12DV8	3meg	18Ω	1.6Ω	.2Ω	0Ω	†215Ω	0Ω	500Ω	730K
V5	12AL8	INF	2.2meg	INF	0Ω	.2Ω	†230Ω	27Ω	4meg	27Ω

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF L8 AND L9.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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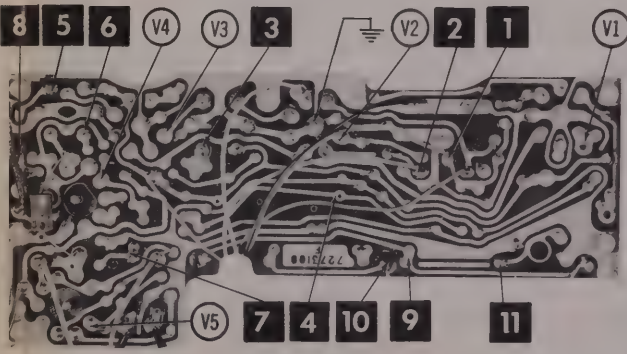


A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12DZ6	V4	Det. - AVC - Driver	12DV8
V2	Converter	12AD6	V5	Trigger	12AL8
V3	IF Amplifier	12EK6			

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	DS501	Output				2N677	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■1000	16	7273810	AFH3-54-41		WP300.9		TVLS-3021.5*	
B	▲500	16							
C	4	32							
C2	1000	1	7271557	PRS6V1000	BBR1000-6	TC110	TD-10006	TVA-1104	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3				7268558						
C4	.047	200		7271670	P288N-047	DF-503	CUB2S47	GTM-2147	ZTM-047	
C5	68			6369	BPD-000068	DD-680	L10Q68	CNO-468	5GA-Q68	
C6A				7273693						
B										
C7	220		5%	7273511	ADM-15-221	TCZ-220	22R5T22		MS-322	
C8	39		N750 10%	6366		TCN-39	C10Q39U	CN7-439	5TCU-Q39S 10%*	
C9	2000			6352	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C10	.1	200		6690	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C11	100		5%	1219498	ADM-15-101	DTZ-100	22R5T1	MCE235	MS-31	
C12	.1	200		6690	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C13	47		10%	6367	ADM-15-470	DD-470	22R5Q47	CNO-447	MS-447	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C14	.01	400		6633	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C15	220			6375	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C16	22		N150 10%	6363						
C17	.22	100		7271555	P288N-22		CUB2P22	GTM-1022	2TM-P22	
C18	100		5%	1219498	1469-0001	DTZ-100	22R5T1	MCE235	MS-31	
C19	.1	200		6690	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C20	100		10%	6371	DI-100	DD-101	L10T1	CNO-310	5GA-T1S 10% *	
C21	.047	100		7272519	P288N-047	DF-503	CUB2S47	GTM-1147	2TM-S47	
C22	.47	50		7269780	P288N-47		CUB2P47	GTM-1047	2TM-P47	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	25K & 3meg	½	7273623					Tone, Split Element
B	5meg	½						Volume, Tap ③ 2 meg
C	Switch							Off-On
R2	110Ω	1(WW)	7273776			110-100	PFL-100	Bias

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	2.2meg	
R4	3.3meg	
R5	10K	
R6	47K	
R7	680K	
R8	1.5meg	
R9	150Ω	
R10	3.3meg	
R11	1.5meg	
R12	1.5meg	

① Temp. Comp.

ITEM No.	RATING	REMARKS
R13	560Ω 5%	
R14	3300Ω 5%	
R15	680K	
R16	47K	
R17	1.5meg	
R18	18Ω	
R19	4.7meg 5%	
R20	3.9meg 5%	
R21	1meg	
R22	680K	

② Fuse Type

ITEM No.	RATING	REMARKS
R23	27Ω 5%	
R24	2.2meg	
R25	150K	
R26	1800Ω	
R27	33K	
R28	100Ω 5W	#7271525 ①
R29	10Ω	
R30	.47Ω 5W	#7270608 ②
R31	56Ω	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		DELCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Antenna Coil	7255738	19-1004	19-1004	BC-565	4610		
L2	Antenna Coil	1221138						1. 8MH
L3	RF Choke	7269684						
L4	RF Coil	1221138						
L5	Osc. Coil	1221151						
L6	Input IF Trans.	1221257	16-6756	16-6756	BC-344	13-PH1		
L7	Output IF Trans.	1221253						
L8	Fil. Choke	1217846						1. 4uh

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L9	.420A	.75Ω	.011 Hy.	7271321				TC-2		

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	13	1	7274354			TA-51			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9Ω Tap ② 3-4Ω	7273626							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	4" x 10"	PM	3-4Ω	7272752		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	7AG	7½A 32V			30707.5 (7AG 7½A 32V)	155009	SFE7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M2	Spark Plate	7271564	
M3	Spark Plate	7271564	
M4	Switch	7273671	Sensitivity, Includes Station Selector Bar
M5	Switch	7268030	Power Solenoid
M6	Switch	7268030	Treadle Solenoid
M7	Switch	7273705	Station Selector
M8	Switch	7271425	Speaker Interlock
M9	Relay	7270545	Tuner Operating
M10	Solenoid & Plunger	1221160	Power
M11	Solenoid & Plunger	1221161	Treadle
	Printed Board	7273100	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	532456	Control
Knob	532455	Tone
Knob	532707	Dummy
Pushbutton	7273140	
Pushbutton Ass'y	1221284	Includes Pushbuttons, Front Bearing Plate & Slides
Pointer Assembly	7273355	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

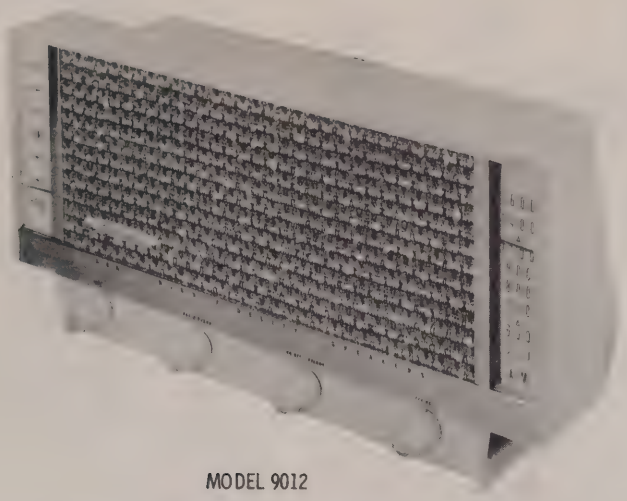
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 9011, 9012, 9013 (Ch. 132.44500)

SILVERTONE MODELS 9011, 9012, 9013 (Ch. 132.44500)



MODEL 9012

TRADE NAME	Silvertone Models 9011, 9012, 9013 (Ch. 132.44500)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC-DC Operated 6 Tube AM Receiver
POWER SUPPLY	110-120 Volts AC-DC
RATING	32 Watts, .35 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 - 1640KC

SILVERTONE MODELS 9011, 9012, 9013 (Ch. 132.44500)

ALIGNMENT INSTRUCTIONS

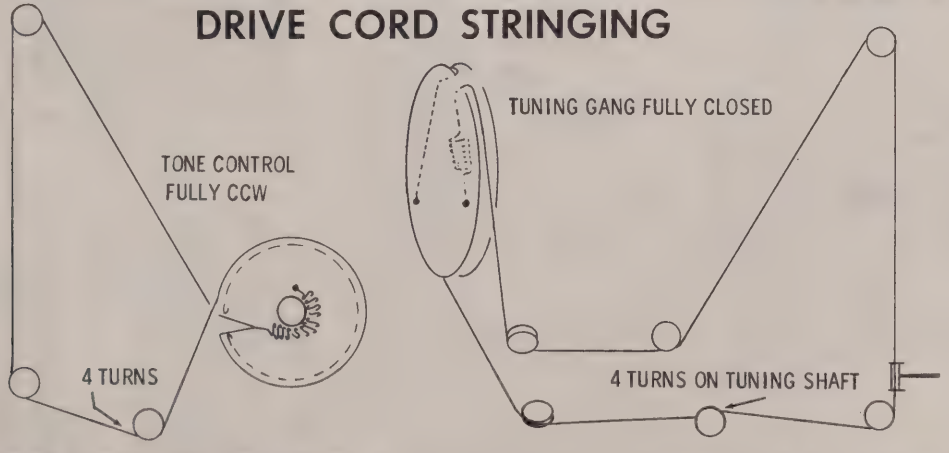
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4, A8, A9 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400% Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1640KC	"	"	A5, A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A8, A9	"

DRIVE CORD STRINGING



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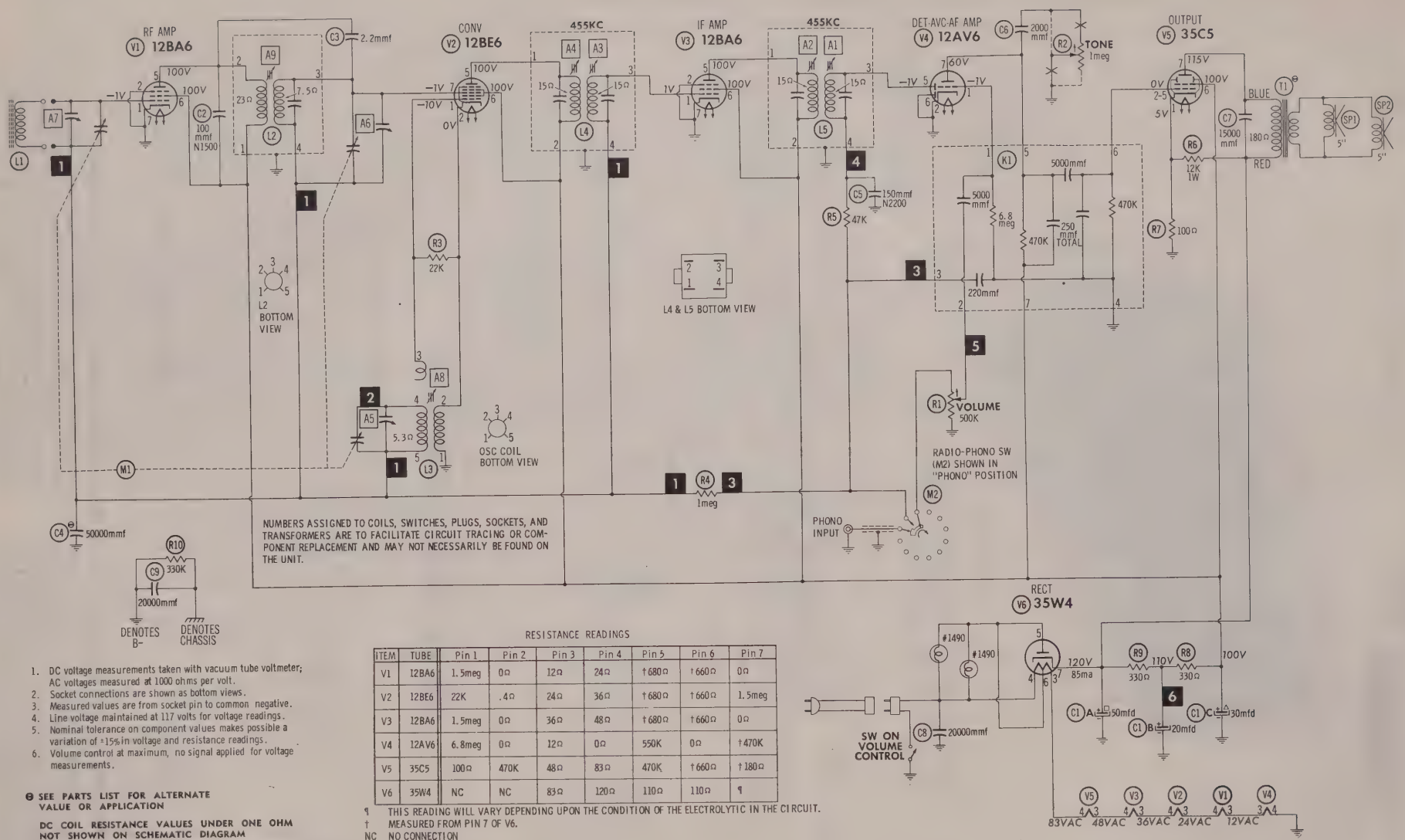
JG235

SET 462 FOLDER 16



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	1.5meg	0Ω	12Ω	24Ω	†680Ω	†660Ω	0Ω
V2	12BE6	22K	.4Ω	24Ω	36Ω	†680Ω	†660Ω	1.5meg
V3	12BA6	1.5meg	0Ω	36Ω	48Ω	†680Ω	†660Ω	0Ω
V4	12AV6	6.8meg	0Ω	12Ω	0Ω	550K	0Ω	†470K
V5	35C5	100Ω	470K	48Ω	83Ω	470K	†660Ω	†180Ω
V6	35W4	NC	NC	83Ω	120Ω	110Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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SILVERTONE MODELS 9011, 9012, 9013 (Ch. 132.44500)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amplifier	12BA6
V2	Converter	12BE6
V3	IF Amplifier	12BA6
V4	Det. - AVC - AF Amp.	12AV6
V5	Output	35C5
V6	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	43711-3	AFH3-11-30	C0080 ‡	PFP311.63		PCL-3440.5	
B	20	150							
C	▲30	150							

‡ Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100		N1500	43957-1		TCL-100				
C3	2.2			20238-4	NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22	
C4	50000				BPD-05	DF-503	H-05S5	BT-150	5HK-S5	①
C5	150		N2200	43957-2						
C6	2000			43674-4	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C7	15000			43674-3	BPD-015	DD-103	BYA10S15	B-115	5HK-S15	
C8	20000			43674-2	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C9	20000			43674-2	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	

① Some versions may use 20000mmf in ths application (Part #43674-2).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	44500-10				PP55A	Volume
B	Switch						Not Req.	Push-Pull, Off-On
R2A	1meg	½	44500-11	B-68		Q17-137	RU16R	Tone
B	Shaft			Not Req.		Not Req.	SL3500	
C	Bushing			Not Req.		Not Req.	SL-38	

RESISTORS

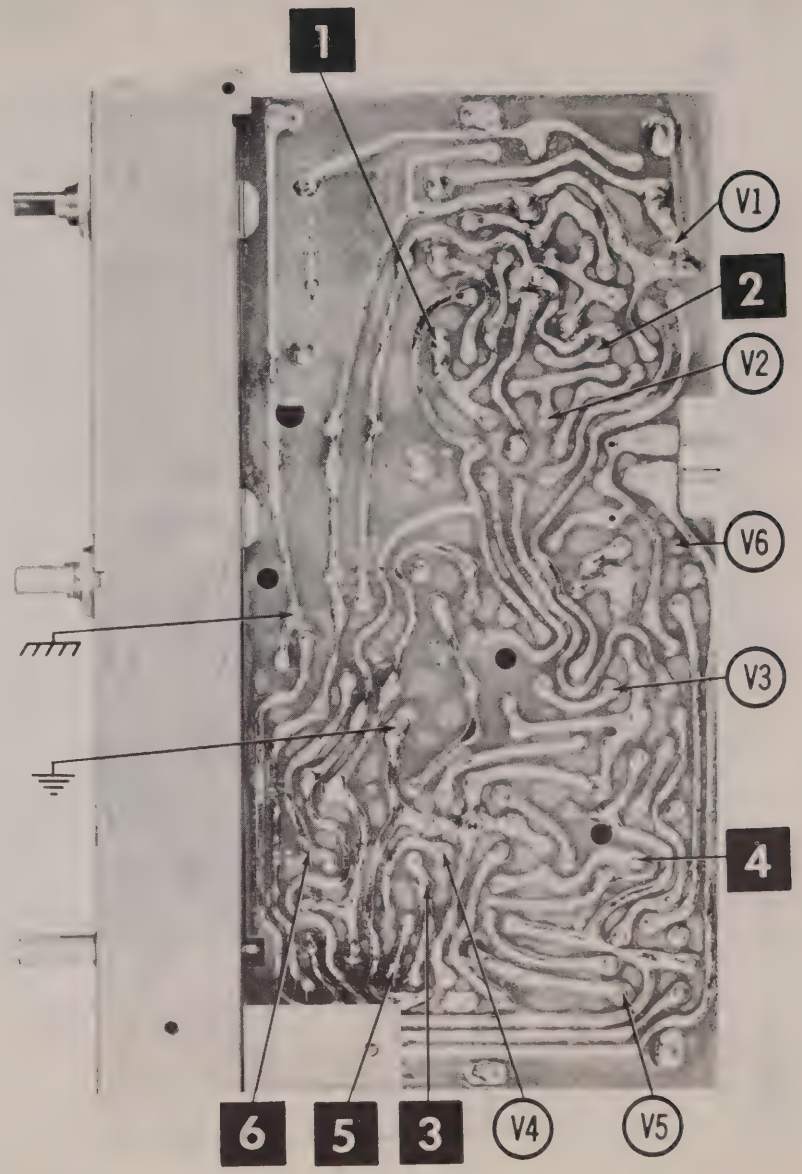
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	22K	
R4	1meg	
R5	47K	
R6	12K 1W	
R7	100Ω	
R8	330Ω	
R9	330Ω	
R10	330K	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Audio Coupling	250mmf, 220mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	43743-2	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	45534-8						
L2	RF Trans.	43829-1						
L3	Osc. Coil	43644-3						
L4	Input IF	44282-1	16-6780	16-6780	BC-356	13-PC9	RF-4	
L5	Output IF	44282-1	16-6780	16-6780	BC-357	13-PC10	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	3-4Ω	42700-13 ①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	① Alternate Part #42700-21

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	6-8Ω	43365-2	5A1Z6.4	
SP2	5"	PM	6-8Ω	43365-2	5A1Z6.4	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	46101-1	3 Gang
M2	Switch	46069-1	Radio-Phono
	Printed Board	46006-1	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

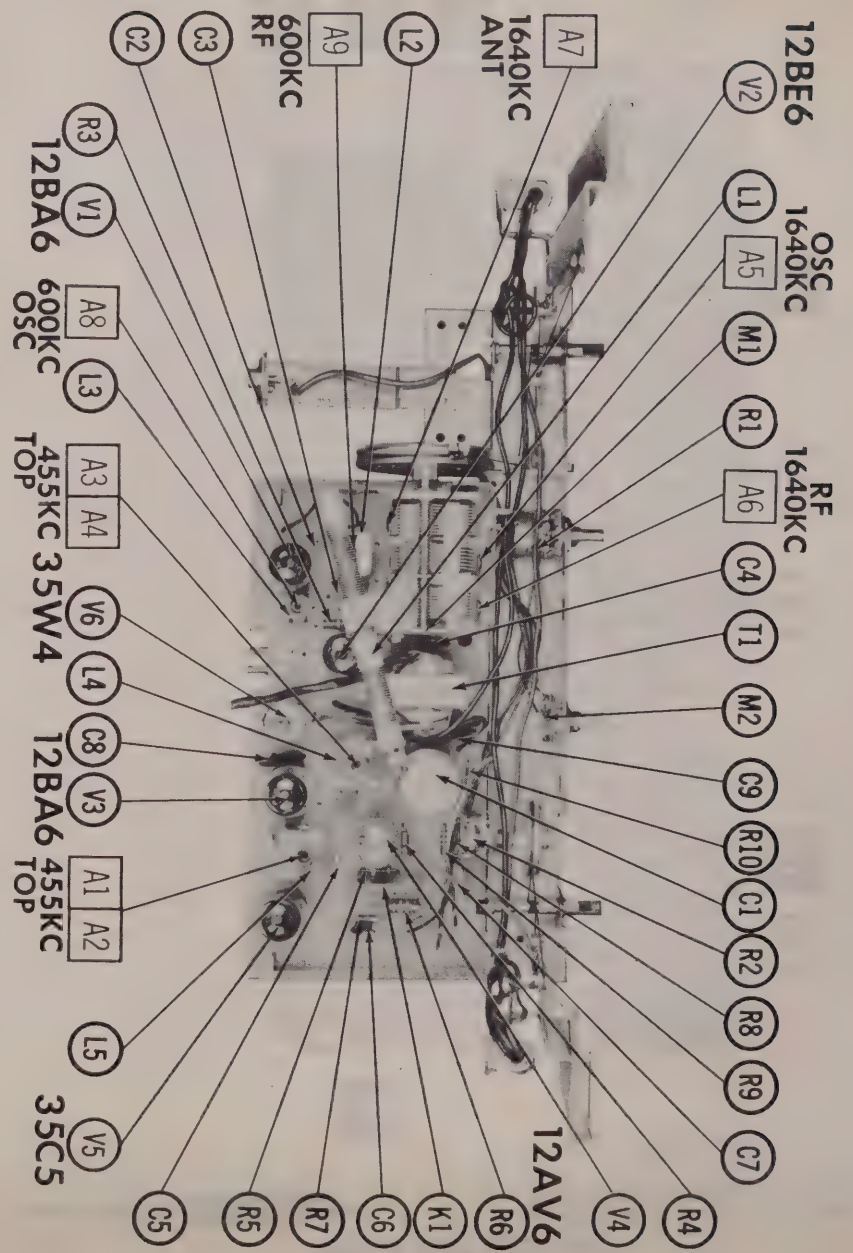
NAME	PART NO.	DESCRIPTION
Knob	45989-48	Model 9011
Knob	45989-17	Model 9012
Knob	45989-138	Model 9013
Cabinet Front	46488-48	Model 9011, Includes Cabinet Front, Grille, Trim Rails, and Crystal
Cabinet Front	45488-17	Model 9012, Includes Cabinet Front, Grille, Trim Rails, and Crystal
Cabinet Front	46488-138	Model 9013, Includes Cabinet Front, Grille, Trim Rails, and Crystal
Cabinet Back	45912-48	Model 9011
Cabinet Back	45912-17	Model 9012
Cabinet Back	45912-138	Model 9013
Pointer	46082-1	Dial
Pointer	46083-1	Tone

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SYLVANIA MODEL 4312
Series (Ch. 1-639-1)

SYLVANIA MODEL 4312
Series (Ch. 1-639-1)

SYLVANIA MODEL 4312
Series (Ch. 1-639-1)

TRADE NAME	Sylvania Model 4312 Series (Ch. 1-639-1)
MANUFACTURER	Sylvania Home Electronics, Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N.Y.
TYPE SET	AC Operated 3 Tube Phono Amplifier with 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 30 Watts, .35 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 959 - PHOTOFACT SET 396 FOLDER 13

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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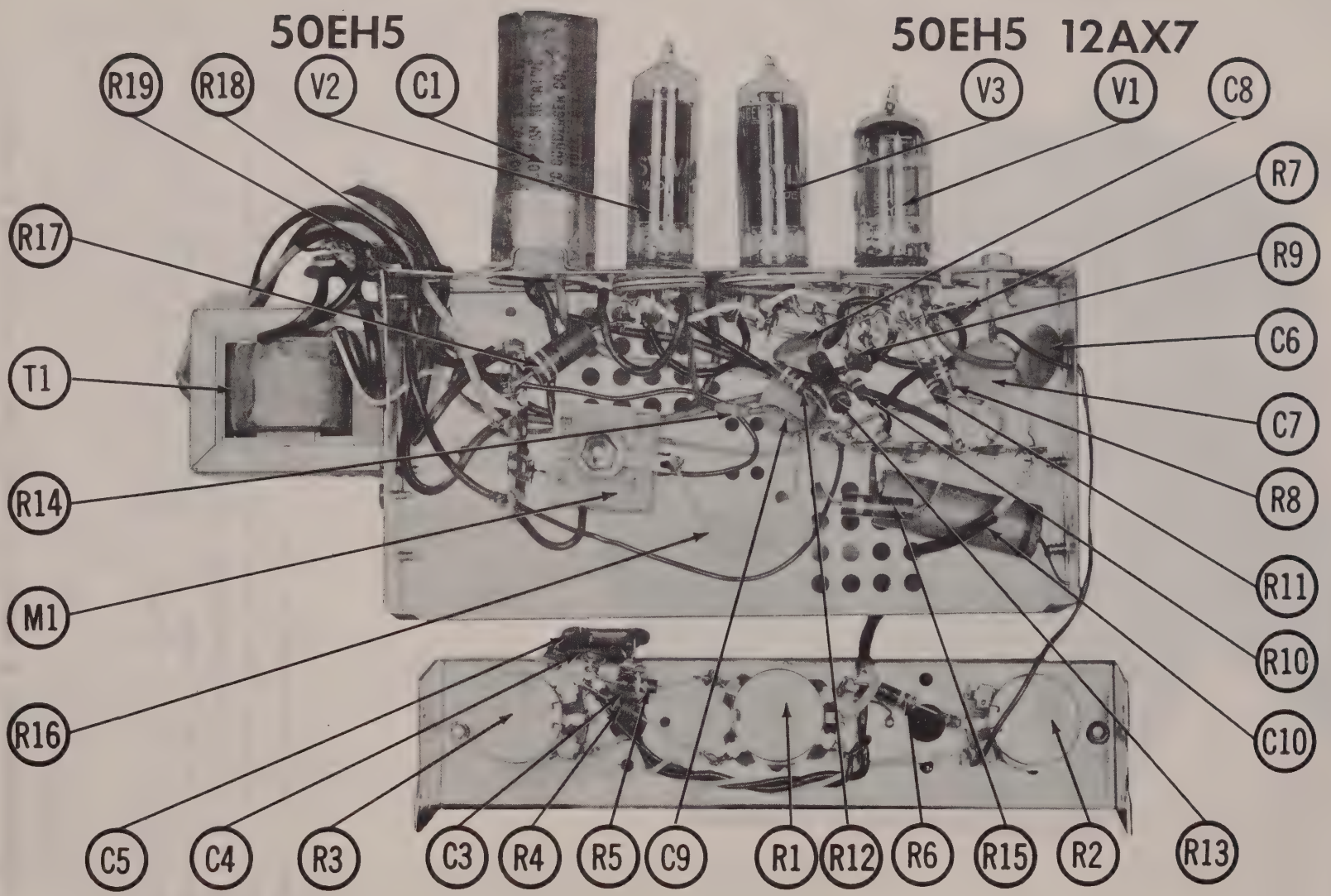
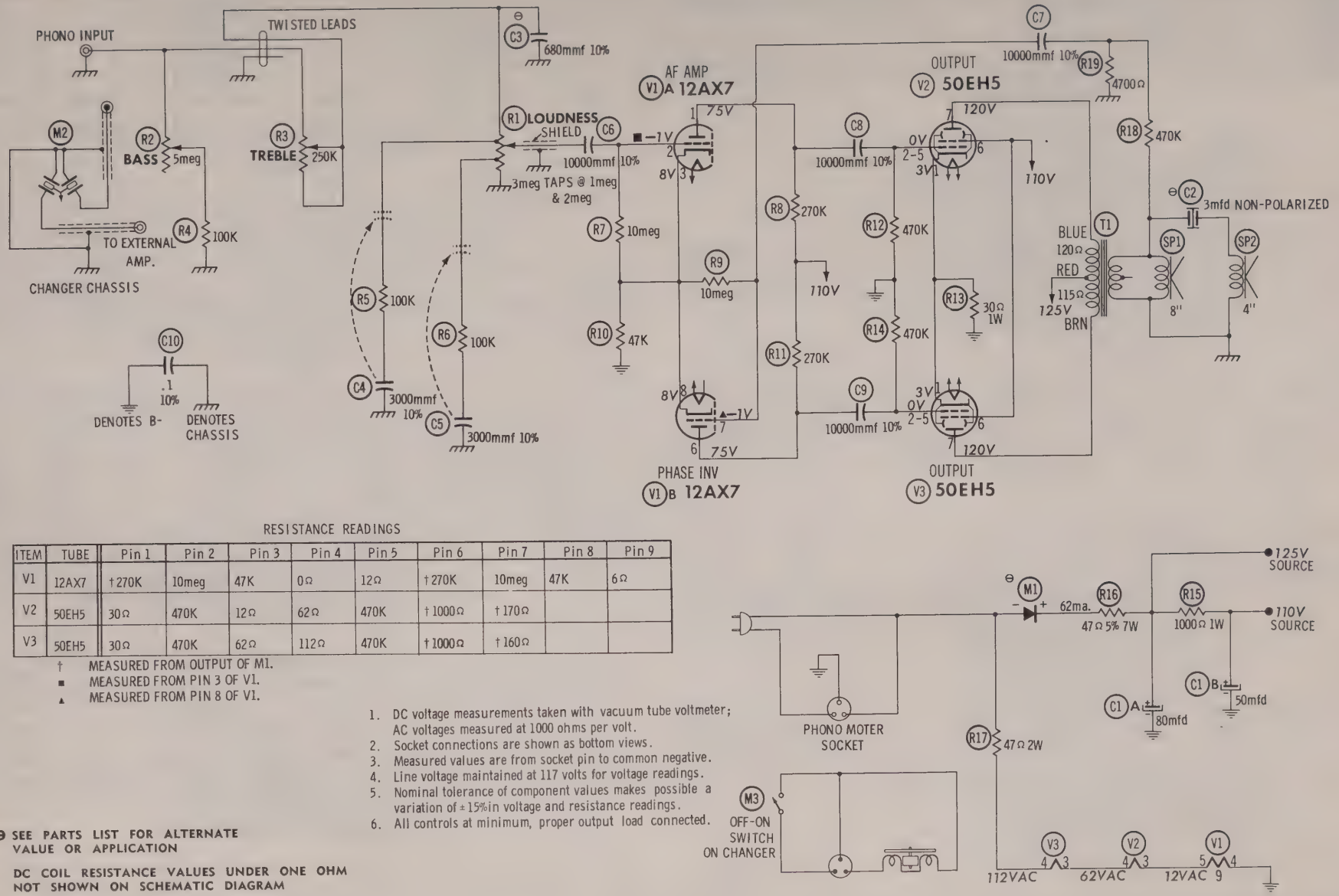


CHASSIS BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	10meg	47K	0Ω	12Ω	†270K	10meg	47K	6Ω
V2	50EH5	30Ω	470K	12Ω	62Ω	470K	†1000Ω	†170Ω		
V3	50EH5	30Ω	470K	62Ω	112Ω	470K	†1000Ω	†160Ω		

† MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM PIN 3 OF V1.
▲ MEASURED FROM PIN 8 OF V1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SYLVANIA MODEL 4312
Series (Ch. 1-639-1)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	AF Amp. -Phase Inv.	12AX7
V2	Output	50EH5
V3	Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PRS150V80-50	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	3	50NP		NP-PRS50 VNP4	BR8-150 †	TCN503		TVAS-1302.1*	①

① Some versions may use 2mfd in this application.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	680		10%			D6-681			5GA-T68S 10% *	①
C4	3000		10%				PM6D3	GTM-6233	5GA-D3S 10% *	
C5	3000		10%				PM6D3	GTM-6233	5GA-D3S 10% *	
C6	10000		10%		DI-10000		PM6S1	GTM-611	5GA-S1S 10% *	
C7	10000		10%		DI-10000		PM6S1	GTM-611	5GA-S1S 10% *	
C8	10000		10%		DI-10000		PM6S1	GTM-611	5GA-S1S 10% *	
C9	10000		10%		DI-10000		PM6S1	GTM-611	5GA-S1S 10% *	
C10	.1	400	10%		V84C4P1		PM4P1	GTM-401	4TM-P1	

① Some versions may use 470mmf in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3meg	½	368009					Loudness, Taps @1meg, 2meg
R2A	5meg	½	360330	B-88	A47-5meg-Z	Q13-141	U65	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	250K	½	360265	B-50	A47-250K-S	Q11-130	U46	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	100K	
R6	100K	
R7	10meg	
R8	270K	
R9	10meg	
R10	47K	
R11	270K	
R12	470K	
R13	30Ω 1W	
R14	470K	
R15	1000Ω 1W	
R16	47Ω 5% 7W	
R17	47Ω	
R18	470K	
R19	4700Ω	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3500Ω CT	3-4Ω CT	430222							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SYLVANIA PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω		8A31	
SP2	4"	PM	3-4Ω		4A15	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SYLVANIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.061A	①	1235AH ②	T150 ②		75 ②	① Selenium Type. Some versions may use Silicon type. ② Selenium Type.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SYLVANIA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2		13-TB *	Not Req.	26S	Not Req.			* Include mounting mechanism.

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Switch		Off-On-Reject (On Changer)

CABINETS & CABINET PARTS

When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

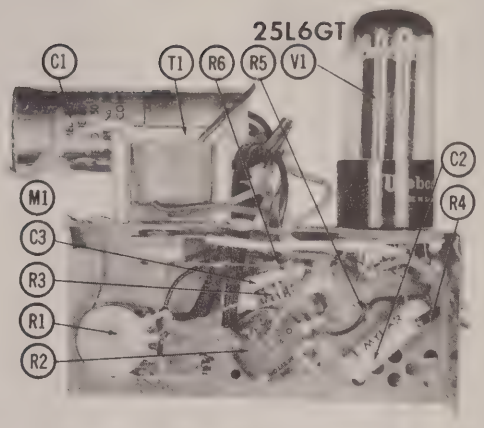
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

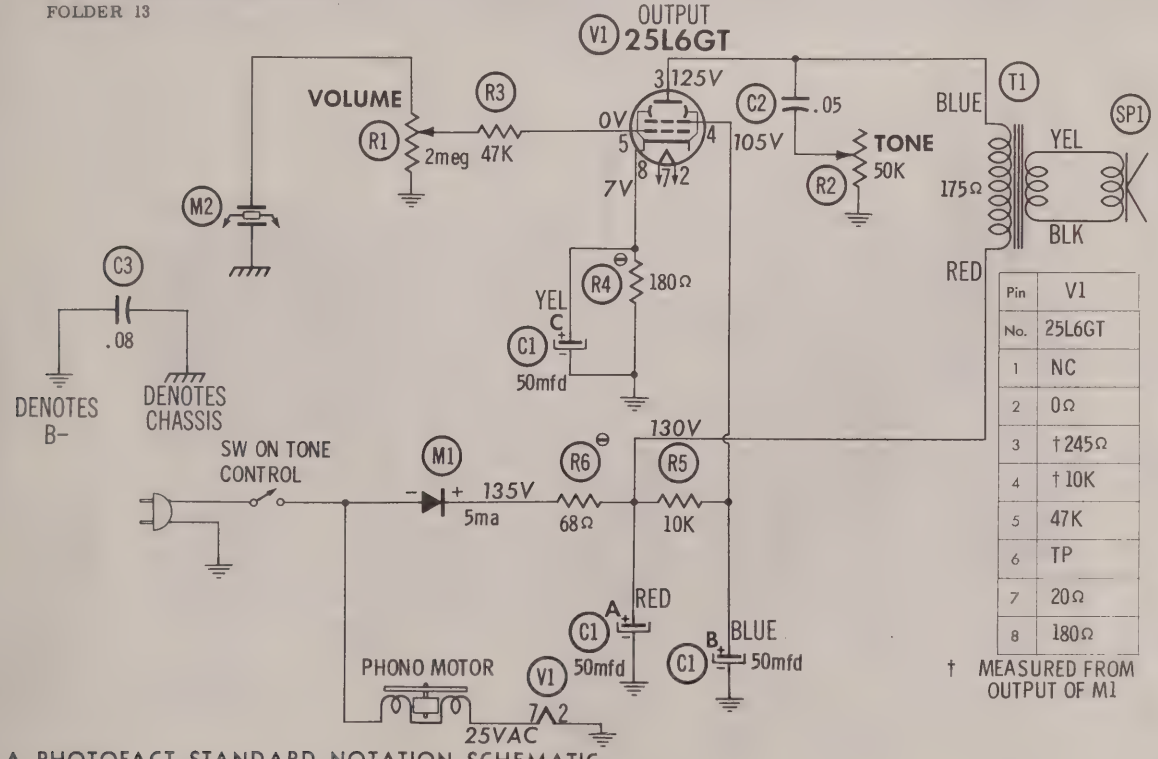
WEBCOR MODELS 1912, 1952
(Ch. 14X279, 14X281)

WEBCOR MODELS 1912, 1952
(Ch. 14X279, 14X281)



TRADE NAME	Webcor Models 1912 (Ch. 14X279), 1952 (Ch. 14X281) (Model Number may have 2 letter prefix)
MANUFACTURER	Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois
TYPE SET	AC Operated One Tube Phono Amplifier With 4 Speed Automatic Record Changer (Model 1912 is Manual Record Player)
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 43 Watts, .41 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #E157-5 — SEE WEBCOR 171 — PHOTOFACT SET 447 FOLDER 13



Pin No.	V1 25L6GT
1	NC
2	0Ω
3	†245Ω
4	†10K
5	47K
6	TP
7	20Ω
8	180Ω

† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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JS341

SET 462 FOLDER 18

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	25L6GT			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	30P257	PR3-020	BBRQ55515C	WT458	TDLD-9	TVA-2453	
B	50	150					TD-50-25	TVA-1206	
C	50	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400		30P255	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C3	.08	400		30P304	P488N-075	DF-753			4TM-S8S *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2meg	½	31P114					Volume
R2A	50K	½	31P107					Tone
B	Switch							Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	47K	
R4	180Ω	(150Ω) *

* Alternate

ITEM No.	RATING	REMARKS
R5	10K	

ITEM No.	RATING	REMARKS
R6	68Ω	(47Ω) *

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2100Ω	3-4Ω	67P065	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	76P049①	4A07	① Model 1952 Series
	3½"	PM	3-4Ω	76P076②		② Model 1912 Series

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	WEBCOR PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.005A	65P117 ①	1234AH①	T065 ①	65A ①	RS 200①	① Selenium Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	WEBCOR PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	21P560							Model 1952 Series, Includes needles
	21P582							Model 1912 Series

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	WEBCOR PART No.	JENSEN PART No.	WALCO PART No.	
M3	21P602-SS † ① *			① Model 1952 Series
	21P601-SS † ② *			② Model 1912 Series
	21P602-LS † ①			* 78 RPM
	21P601-LS † ②			† Jewel

MISCELLANEOUS

ITEM No.	PART NAME	WEBCOR PART No.	NOTES
	Motor Ass'y.	15X257	Model 1912 Series

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	39P206-1	Volume, Tone Model 1952 Series
Knob	39P152-2	Volume, Tone, Off-On Model 1912 Series
Knob	39P209	Speed Change Model 1912 Series
Cabinet	92X080-1	Red, Model 1952
Cabinet	92X080-2	Blue, Model 1952
Cabinet	92X083-4	Beige & Light Grey, Model TP1912
Cabinet	92X083-2	Blue & Light Grey, Model BP1912
Cabinet	92X083-3	Green & Light Grey, Model GP1912
Cabinet	92X083-1	Red & Light Grey, Model RP1912
Handle	39P197-4	Red, Model 1952
Handle	39P197-5	Blue, Model 1952
Handle	39P197-1	White, Model 1912
Tube Service Panel	110P107-T	Model 1952

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

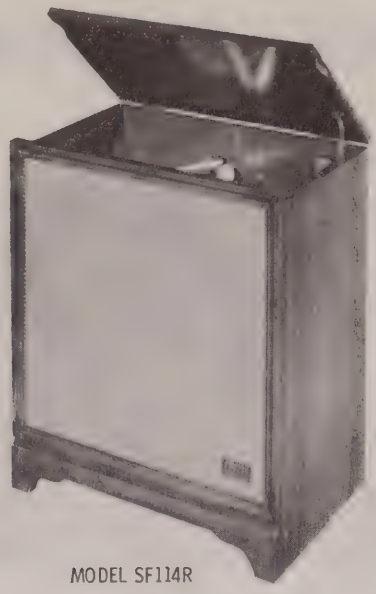
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER

ZENITH MODELS SF114E, R, W, SF117E, R, W, SF2505E, R, W, SRS4E, R, W, SRS7 (Ch. 5B27, 5B29)

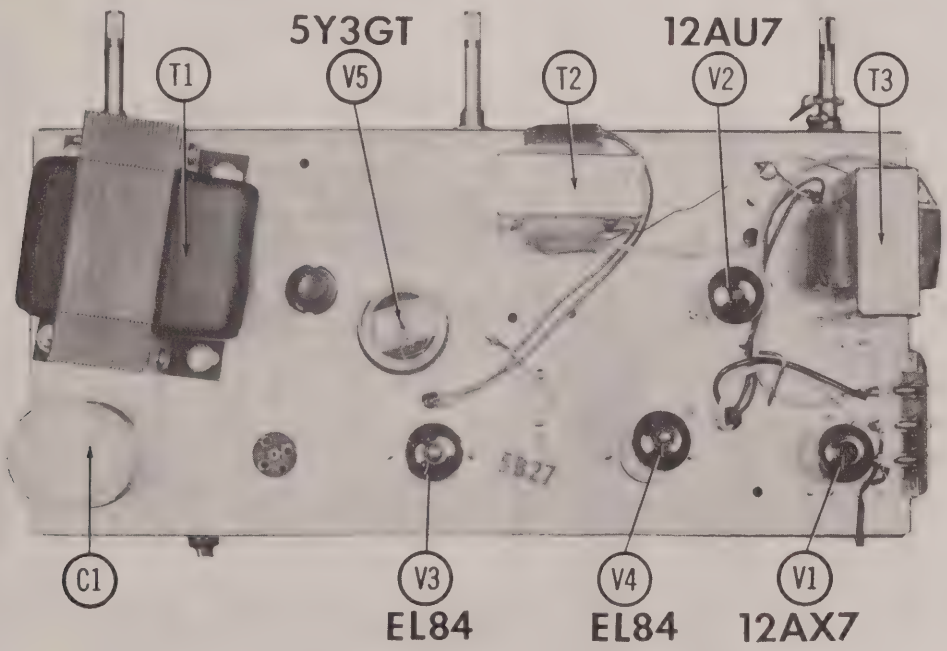
ZENITH MODELS SF114E, R, W, SF117E, R, W, SF2505E, R, W, SRS4E, R, W, SRS7 (Ch. 5B27, 5B29)



MODEL SF114R

TRADE NAME	Zenith Models SF114E, R, W (Ch. 5B27); SF117E, R, W; SF2505E, R, W (Ch. 5B29) Remote Speaker Units SRS4E, R, W; SRS7
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 5 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 61 Watts, .62 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER S-14091 OR 169-106 - SEE ZENITH S-14084 - PHOTOFACT SET 392 FOLDER 14



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JT319

SET 462 FOLDER 19

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AU7
V3	Left Channel Output	EL84/6BQ5
V4	Right Channel Output	EL84/6BQ5
V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	450	22-3046	AFH3-43-50	C0344	FP376.9	TMT-39	TVL-3786	
B	▲40	450							
C	▲20	350							
C2	40	25	22-1156	PRS150V40	BR4015	TC48	TD-40-150	TVA-1413	
C3	3	30NP	22-2945	NP-PRS7405	NLW3-50 †	TCN503	ML6-50 †	TE-1303.1 †	

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

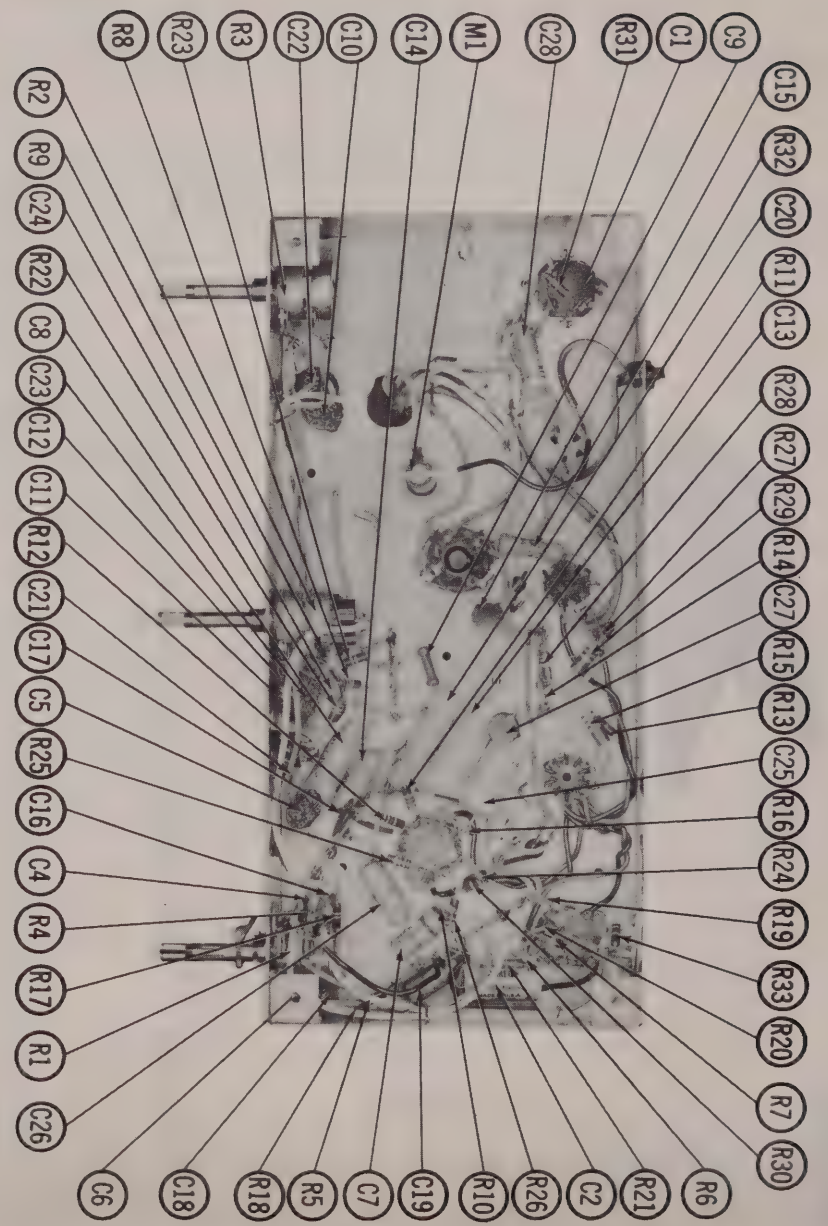
ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	47		N75 10%	22-2376						
C5	2200		10%	22-18	DI-2200		PM6D22	JL-222	6TM-D22	
C6	33		10%	22-2863	DI-33	DD-330	L10Q33	CNO-433	MS-433	①
C7	.0047	200	10%	22-2825	V84C2D47 10%		PM6D47	GTM-2247	6TM-D47	
C8	.047	600		22-2794	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C9	470		10%	22-2302		MD-471	5R5T47	JL-347	MS-347	
C10	2200		10%	22-18	DI-2200		PM6D22	JL-222	6TM-D22	
C11	2200		10%	22-18	DI-2200		PM6D22	JL-222	6TM-D22	
C12	3300		10%	22-2670	DI-3300		PM6D33	JL-233	6TM-D33	
C13	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C14	.01	200	10%	22-2813	V84C2S1 10%		PM4S1	GTM-211	4TM-S1	
C15	47		N75 10%	22-2376						
C16	47		N75 10%	22-2376						
C17	2200		10%	22-18	DI-2200		PM6D22	JL-222	6TM-D22	
C18	33		10%	22-2863	DI-33	DD-330	L10Q33	CNO-433	MS-433	①
C19	.0047	200	10%	22-2825	V84C2D47 10%		PM6D47	GTM-2247	6TM-D47	
C20	.047	600		22-2794	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C21	470		10%	22-2302		MD-471	5R5T47	JL-347	MS-347	
C22	2200		10%	22-18	DI-2200		PM6D22	JL-222	6TM-D22	
C23	2200		10%	22-18	DI-2200		PM6D22	JL-222	6TM-D22	
C24	3300		10%	22-2670	DI-3300		PM6D33	JL-233	6TM-D33	
C25	.1	600		22-2782	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C26	.01	200	10%	22-2813	V84C2S1 10%		CUB4S1	GTM-211	4TM-S1	
C27	47		N75 10%	22-2376						
C28	.01	600		22-2812	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	

① Not used in Ch. 5B29.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg *	1/2	63-4447					Loudness, Left Channel
B	2meg *	1/2						Stereo Balance, Right Channel
R2A	1meg	1/2	63-4449					Bass, Left Channel
B	1meg	1/2						Bass, Right Channel
C	Switch							Stereo-Monaural (Push-Pull)

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R3A	1meg	1/2	63-4448	B-69	AD47-1meg-S	Q11-137	■ UE3913	Treble, Left Channel
B	1meg			SR-69	Not Req.	M11-137		Treble, Right Channel
C	Shaft			Not Req.	KSS-3	Not Req.		

* Taps ⓐ 500K and 1meg. ■ "STA-LOC" Equivalent: FA16A, RU16A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	150K	
R5	82K	
R6	56K	
R7	100K	
R8	270K	
R9	82K	
R10	47K	
R11	1800Ω	
R12	4700Ω	Note 1
R13	1000Ω	
R14	330K	
R15	330Ω 1W	
R16	3300Ω	Note 2
R17	150K	
R18	82K	
R19	56K	
R20	100K	
R21	680Ω	
R22	270K	
R23	82K	
R24	47K	
R25	1800Ω	
R26	4700Ω	Note 1
R27	1000Ω	
R28	330K	
R29	330Ω 1W	
R30	3300Ω	Note 2
R31	5600Ω	
R32	4000Ω 3W	
R33	1.8meg	

Note 1. Chassis 5B29 uses 2700Ω 10% in this application (Part #63-1803).
Note 2. Chassis 5B29 uses 2200Ω 10% in this application (Part #63-1799).

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .62A	660VCT ⓐ .075A	5V ⓐ 2A	6.3VCT ⓐ 2.1A			95-1651	24R40U ①			PC8409 ①	24R40U ①	R-14A ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7200Ω	6-8Ω	95-1650	24S06	A-2904	AU-604	A-3849	24S06	S-53X	
T3	7200Ω	6-8Ω	95-1650	24S06	A-2904	AU-604	A-3849	24S06	S-53X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	QUAM PART No.	NOTES
SP1	10"	PM	6-8Ω	49-855 ①	10A4Z7	① Used in Models SF114E, R, W; SRS4
SP2	3½"	PM	12-14Ω	49-846 ①②	3A15T	② Includes C3.
	12"	PM	6-8Ω	49-852 ③	12A6PA	③ Used in Models SF117E, R, W, SF2505E, R, W; SRS7
	5"	PM	3-4Ω	49-856 ②③	5A1Z3.4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 250V	136-36	62-17	312002. (3AG 2A 250V)	342001	AGC2	HKP

PHONO CARTRIDGE

ITEM No.	ZENITH PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2	142-92	13-T 13-TB *	Not Req. Not Req.	26S †	Not Req.			* Includes mounting mechanism † Use PT-3 mounting

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	ZENITH PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3	78RPM	† E98 or ♦ E98D	† W-101STS * or † W-102S * or ♦ W-101STD *	† Jewel ♦ Diamond * Includes Cartridge
	LP	† E98X or ♦ E98XD		

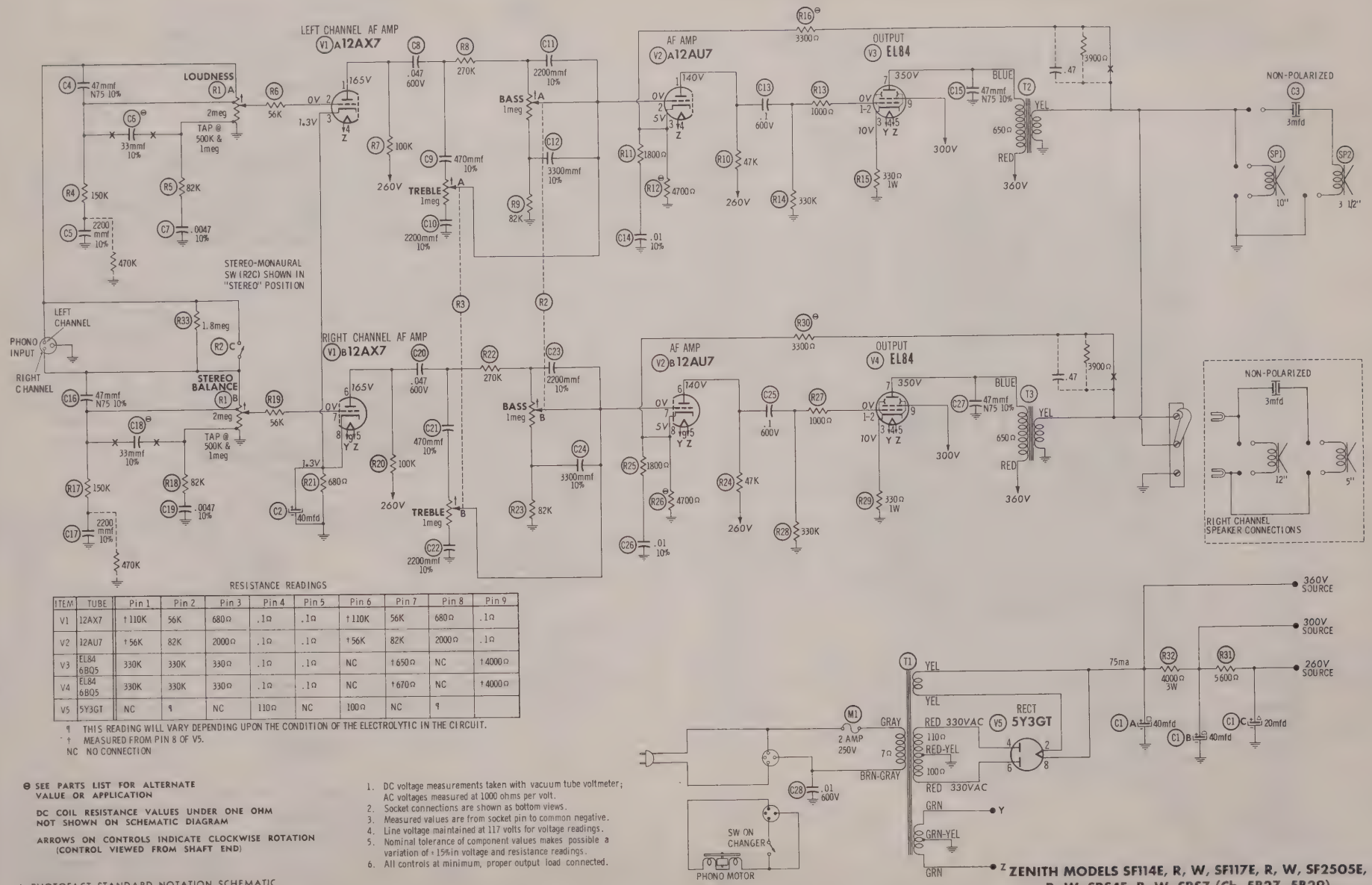
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	46-2113	Volume (Stereo)
Knob	S-46163	Volume (Ring Ass'y)
Knob	46-2148	Volume, Model SF2505E, R, W
Knob	46-2114	Tone, All Models Except SF-2505R, E, W
Knob	46-2147	Tone, Model SF-2505R, E W
Cabinet	14-2565	Model SF114W
Cabinet	14-2565E	Model SF114E
Cabinet	14-2565R	Model SF114R
Cabinet	14-2642E	Model SF117E
Cabinet	14-2642R	Model SF117R
Cabinet	14-2642W	Model SF117W
Cabinet	14-2640E	Model SF2505E
Cabinet	14-2640R	Model SF2505R
Cabinet	14-2640W	Model SF2505W
Leg	96-177	Model SF117R
Leg	96-178	Model SF117E
Leg	96-201	Model SF117W
Leg	96-215	Model SF2505R
Leg	96-216	Model SF2505E
Leg	96-217	Model SF2505W

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†110K	56K	680Ω	.1Ω	.1Ω	†110K	56K	680Ω	.1Ω
V2	12AU7	†56K	82K	2000Ω	.1Ω	.1Ω	†56K	82K	2000Ω	.1Ω
V3	EL84 6BQ5	330K	330K	330Ω	.1Ω	.1Ω	NC	†650Ω	NC	†4000Ω
V4	EL84 6BQ5	330K	330K	330Ω	.1Ω	.1Ω	NC	†670Ω	NC	†4000Ω
V5	5Y3GT	NC	¶	NC	110Ω	NC	100Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION

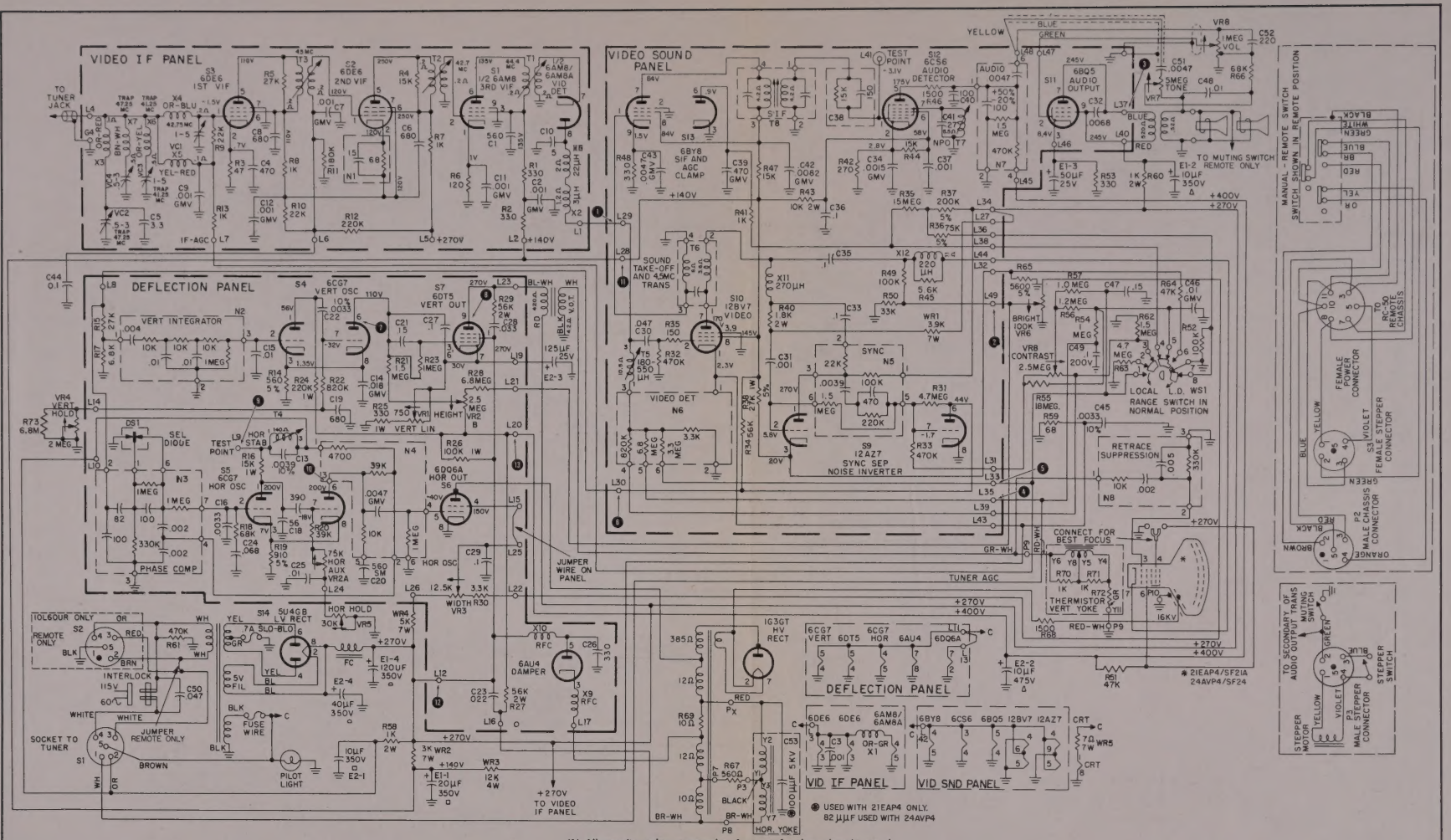
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

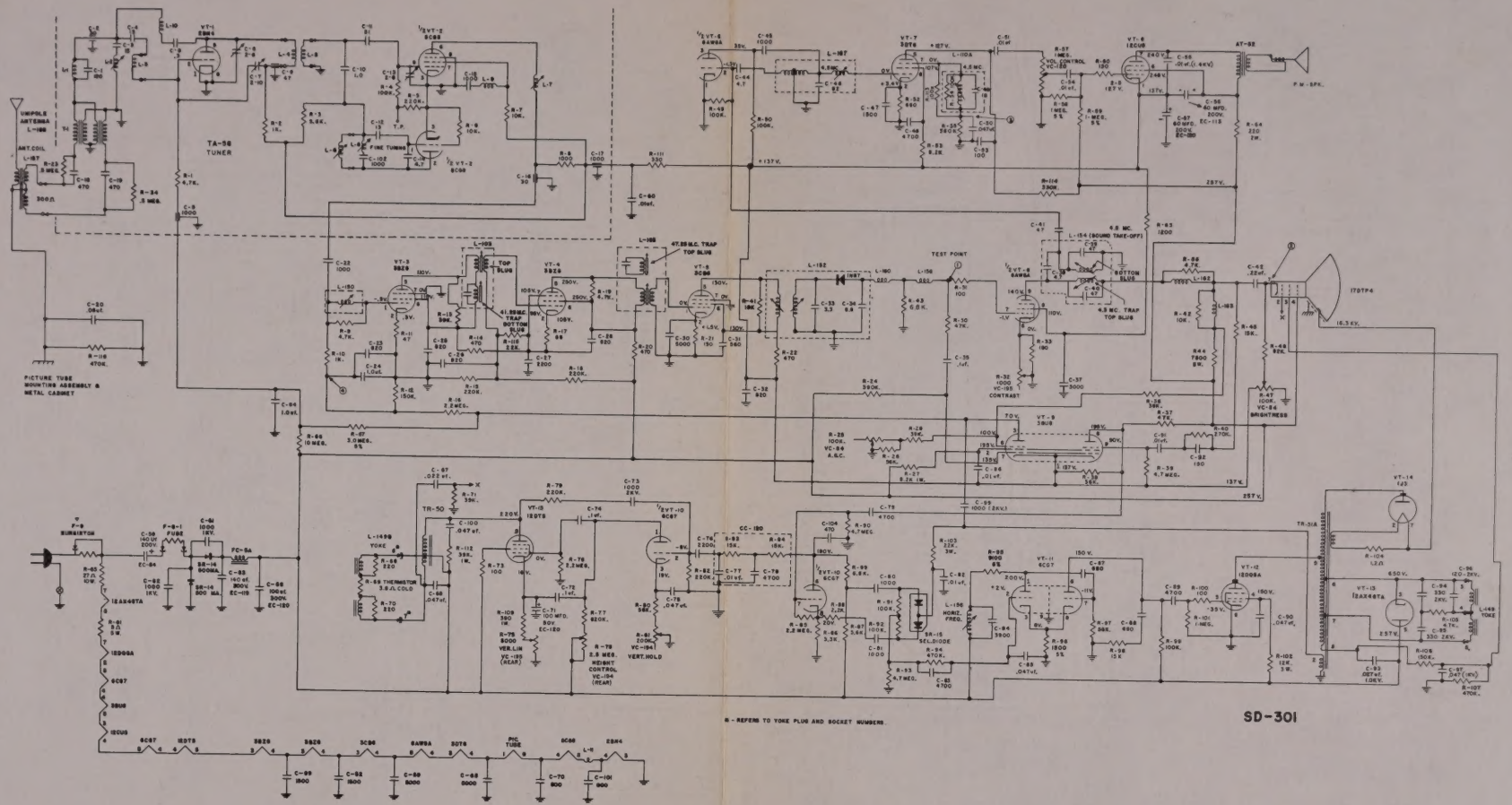
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1959



PHILCO MODELS H-4686S, SL, SLR, SR, H-6636SLR, SR, SWR, UH-4686S, SL, UH-6636SLR, SR, SWR (CH. 10L60, R, U, UR)

(1) All capacitor values greater than 1 are mmf, unless otherwise noted.
(2) All capacitor values less than 1 are in mfd, unless otherwise noted.
(3) All resistors are ½ watt, 10% carbon, unless otherwise noted.
(4) Arrow through control indicates clockwise rotation.
(5) Voltages are dc from point shown to chassis unless otherwise noted.
(6) Voltages were read using a 20,000 ohm/volt meter.
(7) Voltages were taken under following conditions:
The receiver was adjusted for good quality picture; i.e., normal contrast, brightness, width, height, vertical lin. and sound, then the signal is removed.

Schematic Diagram Courtesy of Philco Corporation



TRAV-LER MODELS X1770, 1788, 1790 (CH. 1150-19, 1156-39)

Schematic Diagram Courtesy of Trav-Ler Radio Corporation

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